

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

71
IS&T



United States
Department of
Agriculture

Forest Service

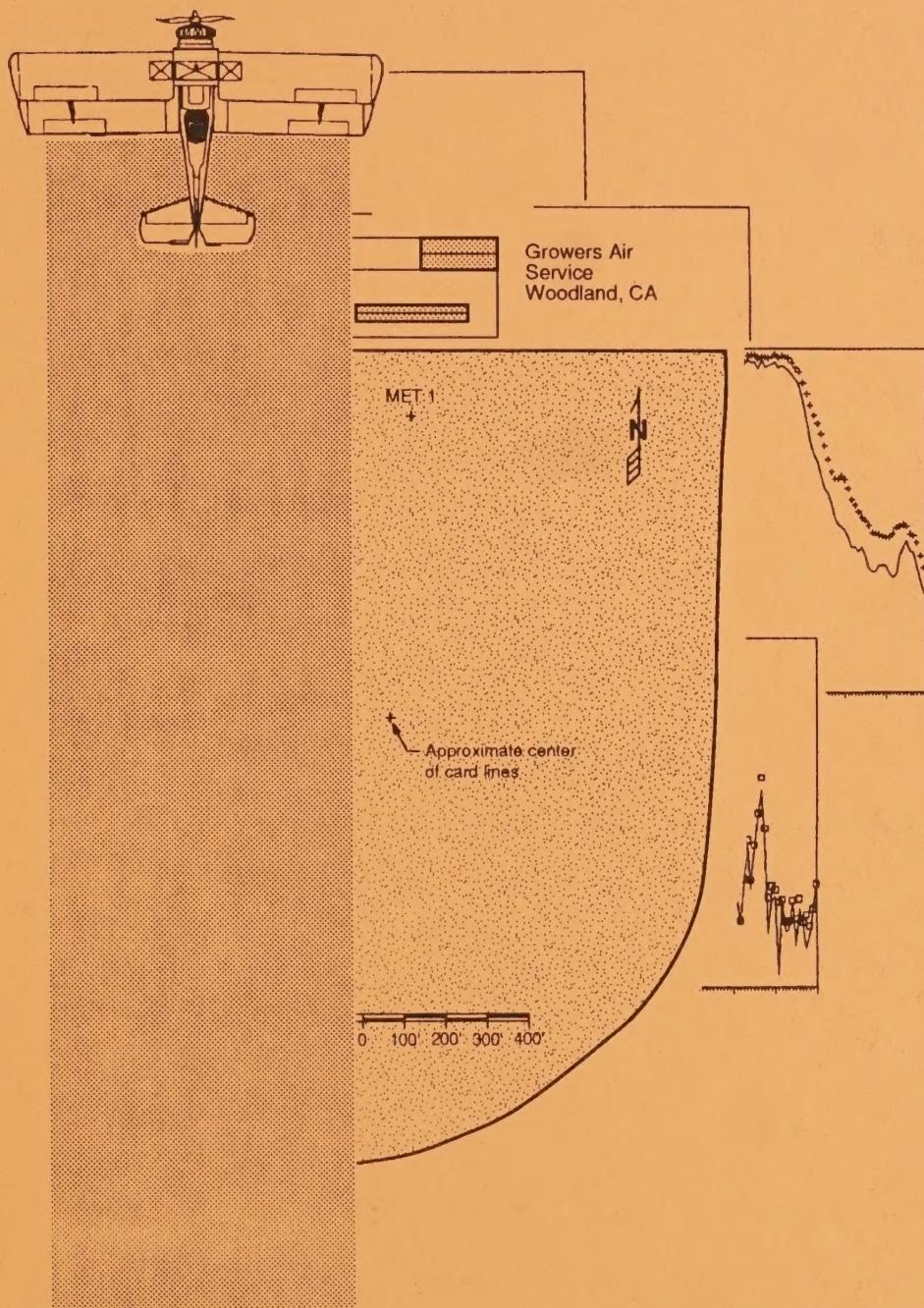
Technology &
Development
Program

3400-Pest
9134-2812-MTDC



aSB945
G9E45
1991

TM Biocontrol-1 and Gypchek Airport Spray Trials



United States
Department of
Agriculture



NATIONAL
AGRICULTURAL
LIBRARY

Advancing Access to
Global Information for
Agriculture

Pesticides used improperly can be injurious to human beings, animals, and plants. Follow the directions and heed all precautions on labels. Store pesticides in original containers under lock and key—out of the reach of children and animals—and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides where there is danger of drift when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

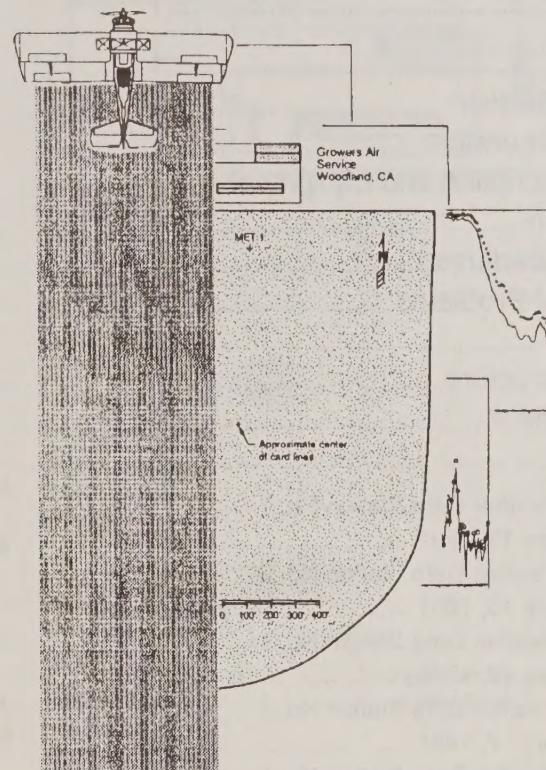
Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment, if specified on the label.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Environmental Protection Agency, consult your local forest pathologist, county agriculture agent, or State extension specialist to be sure the intended use is still registered.



TM Biocontrol-1 and Gypchek Airport Spray Trials



Robert Ekblad
Project Leader

Donald A. Lassila
Mechanical Engineering Technician

Technology & Development Program
Missoula, Montana 59801

5E52P29
Wind

April 1991

Conducted spraying trials using
conventional aircraft and ground
spraying equipment.
Testing various treatment lines
using TM Biocontrol-1
and Gypchek.

4. Contact Deployment and Deployment
Decommissioning

Decommission the system

Contents

Introduction	1
1. General	1
2. Test Configuration	1
3. Tower Configuration	1
4. Sensor Description and Equipment Description	1
5. Testing Procedures	2
6. Summary of Problems	2
7. Test Log	3
8. Data File Structure	4
9. Test Personnel	4
10. Plots	4
Davis Weather Data Station No. 1 January 15, 1991	5
Davis Weather Data Station No. 2 January 15, 1991	36
Davis Weather Data Station No. 1 January 17, 1991	67
Davis Weather Data Station No. 2 January 17, 1991	88
Davis Weather Data Station No. 1 January 18, 1991	109
Davis Weather Data Station No. 2 January 18, 1991	120

The EMCOT Weather stations (Event Model For Complex Terrain) were used to acquire meteorological data as part of spray testing at Davis/Woodland California during the period from January 15 through January 18, 1991. Our objectives were to determine characteristics of TM Biocontrol-1 and Gypchek aerially sprayed through helicopter and fixed-wing spray systems, measure deposit data with sufficient meteorological support to input into AGDISP and FSCBG models, and identify problems associated with dispersing the materials through the spray systems. This report details the EMCOT system configuration and presents the testing and data summary information.

1. General

The EMCOT weather station is a remote meteorological data acquisition system. It consists of a requirements specified suite of sensors, such as anemometers, thermocouples, and other meteorological instruments, mounted on a tower and connected to a Campbell Scientific (CSI) Model CR-10 Datalogger. The Datalogger is responsible for sensor data selection. It generates outputs at specific intervals. An R.F. Modem (Radio Telemetry) is connected to the Datalogger to provide an archive, report, and real time display functions. A Zenith Turbosport 386 PC connected to R.F. Modem Base Station collected the Data from each station.

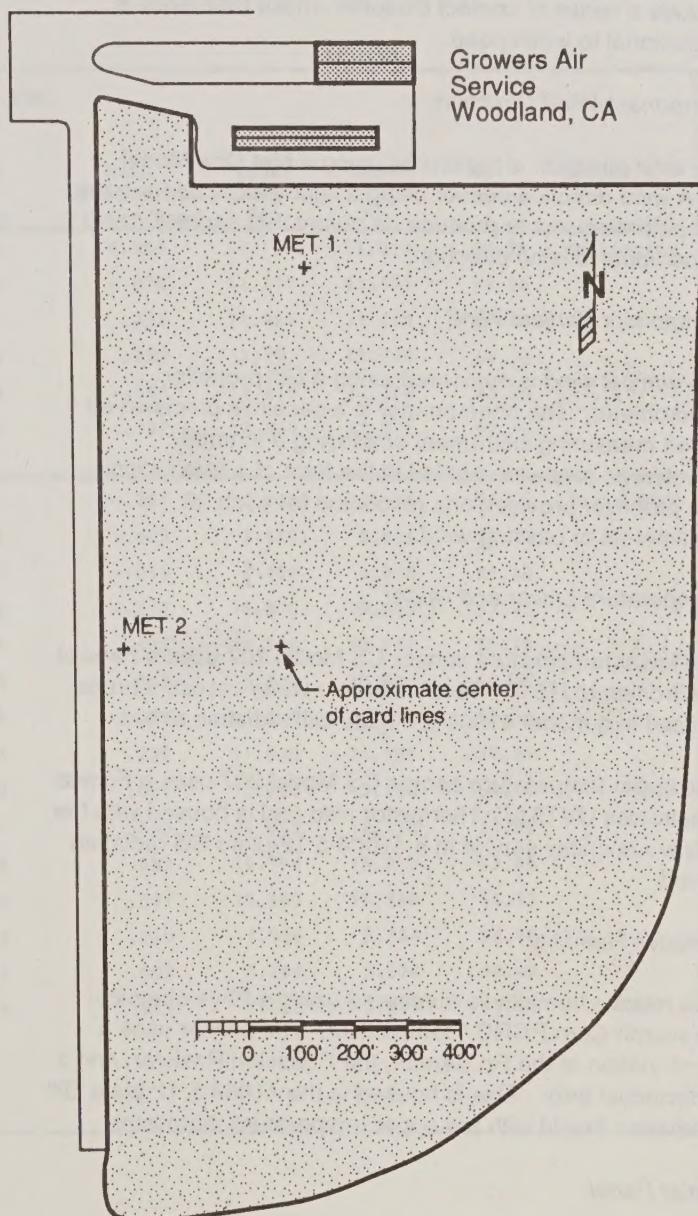
2. Test Configuration

For this test, two towers were located in the testing area. Tower 1 was located at the map site designated MET 1. Tower 2 was located at the map site designated MET 2. The testing site is a fairly level but planted field next to the Grower Air Service Airfield. The site is located approximately Latitude 38 degrees 36.9 minutes and longitude 121 degree 44.8 minutes.

3. Tower Configuration

This section describes the sensors and equipment used on the towers. Both towers were configured identically.

- Component windspeed (Meters/sec)
- Component wind direction (degrees)
- Component wind vertical (meters/sec)
- Temperature (Celsius)
- Relative humidity (percent RH)
- Solar Panel
- Mast
- Datalogger and RF Modem
- RF base station and computer



4. Sensor Description and Equipment Description

Component Windspeed

The wind speed is measured using a Met-One Model 014A windspeed sensor. This is a three-cup anemometer assembly and simple magnet-read switch assembly to

produce a series of contact closures whose frequency is proportional to windspeed.

Component Wind Direction

The wind direction is measured using a Met One Model 024A wind direction sensor using a light-weight air-foil vane and potentiometer to produce an output that varies proportional to wind direction.

Component Vertical Wind

The vertical wind is measured using a Gill propeller anemometer. The anemometer is a sensitive precision air speed measuring instrument employing a foamed polystyrene propeller molded in the form of a true helicoil. The propeller provides one revolution for each 30 centimeters of passing wind.

Temperature Lower and Upper

The lower temperature sensor CS Model 107 uses a Fenwal Electronics UUT51J1 Thermistor in a water-resistant probe housed in a model 41301-5 6 plate Gill radiation shield.

The upper temperature sensor CS Model 207 uses a Fenwal Electronics UUT51J1 Thermistor also and is housed with the relative humidity sensor in a 41004-5 12-plate Gill radiation shield

Relative Humidity

The relative humidity is measured using a Phys-chemical Research Corp PCRC 11Rh sensor. The sensor uses a combination of the Rh Sensor, the Precision Resistor, and a Polynomial error. This is housed in the 41004-5 12-plate Gill Radiation Shield with the upper temperature thermistor.

Solar Panel

The solar panel is a model SX 20 using a photovoltaic power source used to power and recharge the batteries with the CS Datalogger.

Mast

The mast is a Clark mast Model DAF20 using pneumatic operation to telescope to a height of 6.24 meters (20.5 feet) and retract to 1.83 meters (6 feet).

Datalogger and RF Modem

The Datalogger is a Campbell Scientific CR-10 with 64k of

internal memory (RAM). The CR-10 datalogger is used with the CR10WP wiring panel and battery pack.

The C.S. Model DC95 RF Modem and Motorola HT 90 two-way portable radio and External Antenna are connected to the CR10 Datalogger.

RF Base Station and Computer

The C.S. R.F. base station Model PS232 provides a single desktop base station system incorporating the DC 95 RF Modem, UHF radio 23VDC/120 a.c. power supply and pc board that is connected to a Zenith Turbosport 386 portable personal computer with the Campbell Scientific software to operate the datalogger.

5. Testing Procedures

During testing, the Datalogger obtained sensor readings once each second and output these data to the storage Modular. The windspeed, wind direction, and vertical windspeed were stored at 1-second intervals. The lower and upper temperatures and relative humidity are stored at 1-minute intervals.

The stored data is then processed to the 1-minute averages. The data plots (graphs) are presented in 1-minute averages for each hour.

6. Summary of Problems

The only problem that arose was the weather itself. The testing could only be accomplished during low windspeeds and moderate humidity.

The EMCOT weather stations functioned properly.

7. Test Log

TEST LOG										
Test Run	Julian Date	Date January 1991	Time Recorded	Wind Speed Meters/Sec	Wind Dir Degrees	Wind Component Meter/Sec	Lower Temp °C	Upper Temp °C	RH Percent	Aircraft
1	15	15	1141	3.526	2.445	0.008	11.150	11.010	90.20	Helicopter
2	15	15	1157	3.139	338.489	-.026	11.350	11.120	89.50	
3	15	15	1227	3.646	347.857	.030	11.680	11.440	88.00	
4	15	15	1333	4.712	327.686	.022	12.30	12.030	84.30	
5	15	15	1346	5.125	334.504	-.063	12.410	12.200	83.20	
6	15	15	1358	3.446	328.216	-.127	12.360	12.220	82.30	
7	17	17	0805	0.527	24.102	-.201	2.368	4.110	97.20	Fixed Wing
8	17	17	0819	2.246	70.624	-.003	3.153	3.936	96.20	
9	17	17	0834	2.379	73.347	-.010	4.458	5.016	95.20	
10	17	17	0942	2.806	21.388	-.092	10.870	10.800	57.77	
11	17	17	0952	2.273	62.101	.145	10.170	10.610	59.72	
12	17	17	1002	2.193	48.179	.022	10.400	10.610	60.45	
13	17	17	1026	2.499	54.975	.073	11.580	11.490	59.04	
14	17	17	1034	1.900	57.741	.226	11.830	11.980	57.81	
15	17	17	1053	2.433	44.440	.031	12.050	12.260	56.16	
16	17	17	1611	3.939	153.428	.080	16.030	16.120	43.99	
17	17	17	1624	3.579	152.289	.053	15.790	15.950	43.84	
18	17	17	1637	4.019	143.148	.031	15.360	15.590	44.37	
19	18	18	0748	2.033	234.849	.000	1.959	2.724	98.70	
20	18	18	0805	2.353	239.107	.002	3.288	3.676	98.40	
21	18	18	0821	1.806	236.204	.011	3.562	3.573	97.90	

8. Data File Structure

PROGRAM: DAVIS, CA JAN 1991

Wind Spd, DIR & W-COMP 1-SEC INTERVAL

LOW & UP TEMP, RH & BAT VOLTS 1-MINUTE INTERVAL

PROGRAM D.A. LASSILA 406-329-3924

INPUT CHANNEL USAGE:

1. WIND DIRECTION
2. W COMPONENT
3. LOWER TEMPERATURE
4. UPPER TEMPERATURE
5. % RELATIVE HUMIDITY

INPUT MEMORY USAGE:

1. WIND SPEED (MPS)
2. WIND DIRECTION (DEG)
3. W COMPONENT (MPS)
4. LOWER TEMPERATURE (DEG) 107 PROBE
5. UPPER TEMPERATURE (DEG) 107 PROBE
6. RELATIVE HUMIDITY (%)
7. STATION #
8. BATTERY VOLTAGE (VOLTS)

OUTPUT ARRAY DEFINITIONS:

1. STATION #
2. TIME (HHMM)
3. WIND SPEED
4. WIND DIRECTION
5. W-COMP
6. LOWER TEMP (DEG C)
7. UPPER TEMP (DEG C)
8. HUMIDITY
9. BATTERY VOLTS

9. Test Personnel

The following personnel were involved in the test:

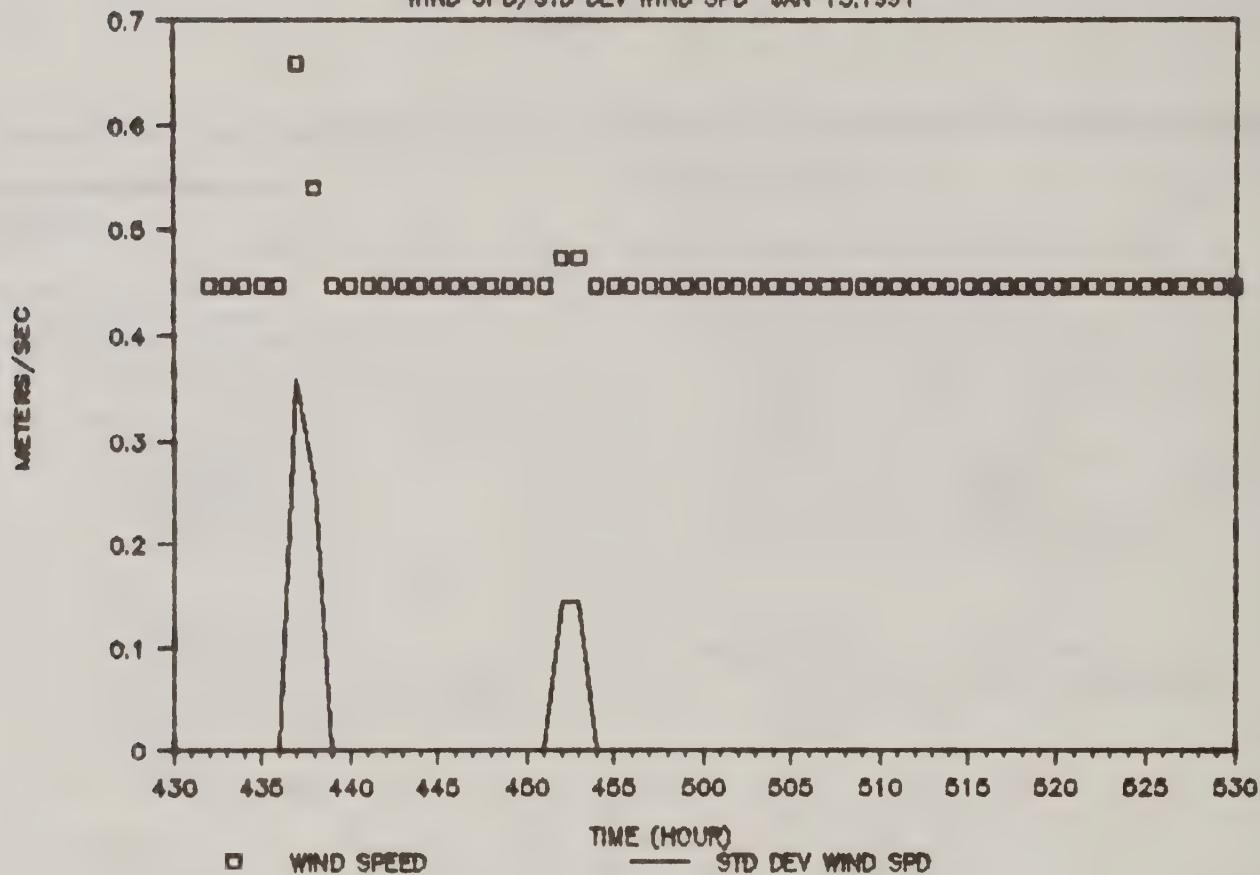
Jack Barry, USFS, Davis, CA
James Hadfield, USFS, Portland, OR
Richard Reardin, USFS, Morgantown, WV
Tim McConnell, USFS Portland, OR
Pat Skyler, USFS, Davis, CA
R. Beckwith, USFS, Corvallis, OR
D. Grimble, USFS, Corvallis, OR
D. Lassila ,USFS MTDC, Missoula, MT
Russ Stocker, Pilot, Davis, CA

10. Plots—Pages 5-130 (*The data plots (graphs) are presented in 1-minute averages for each hour.*)

Davis Weather Data Station No. 1
January 15, 1991

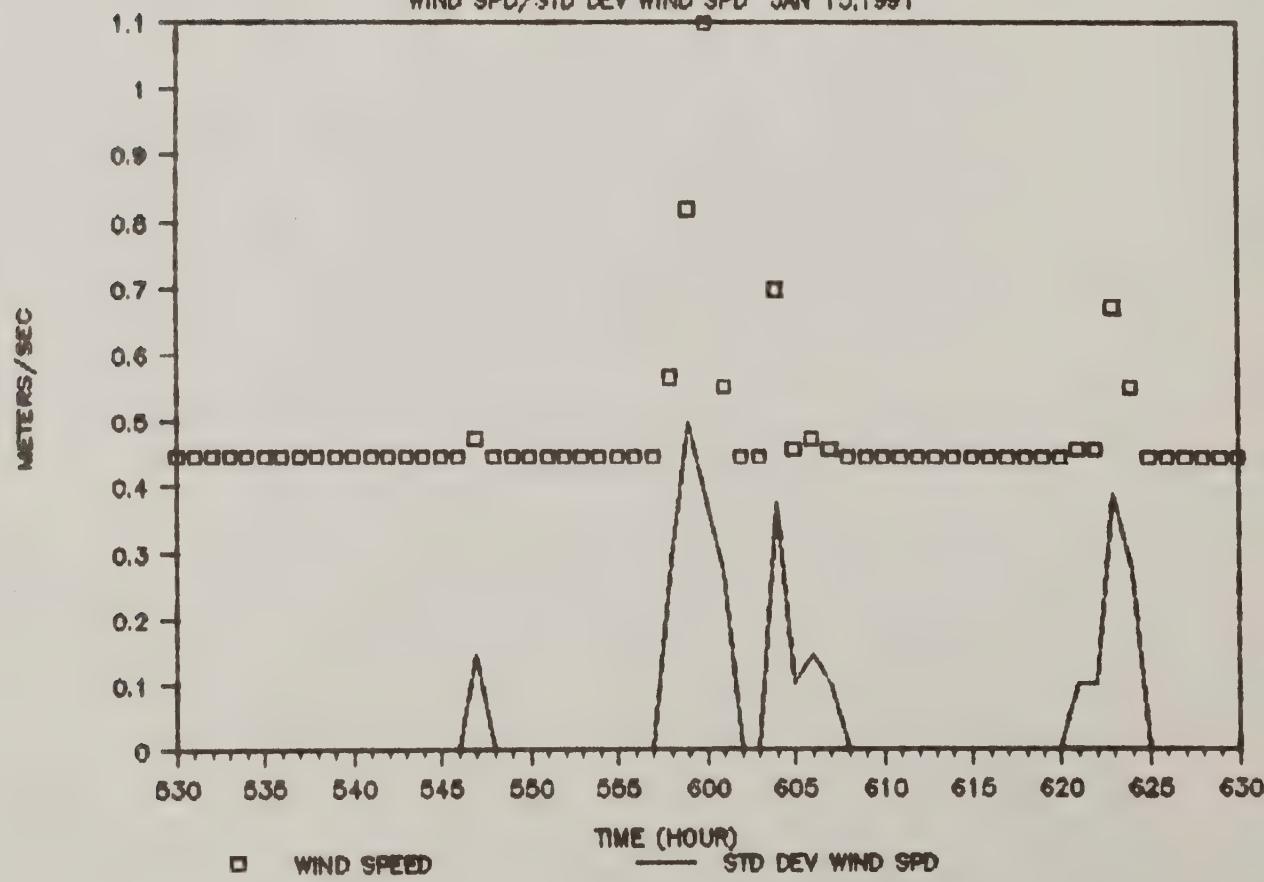
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15,1991



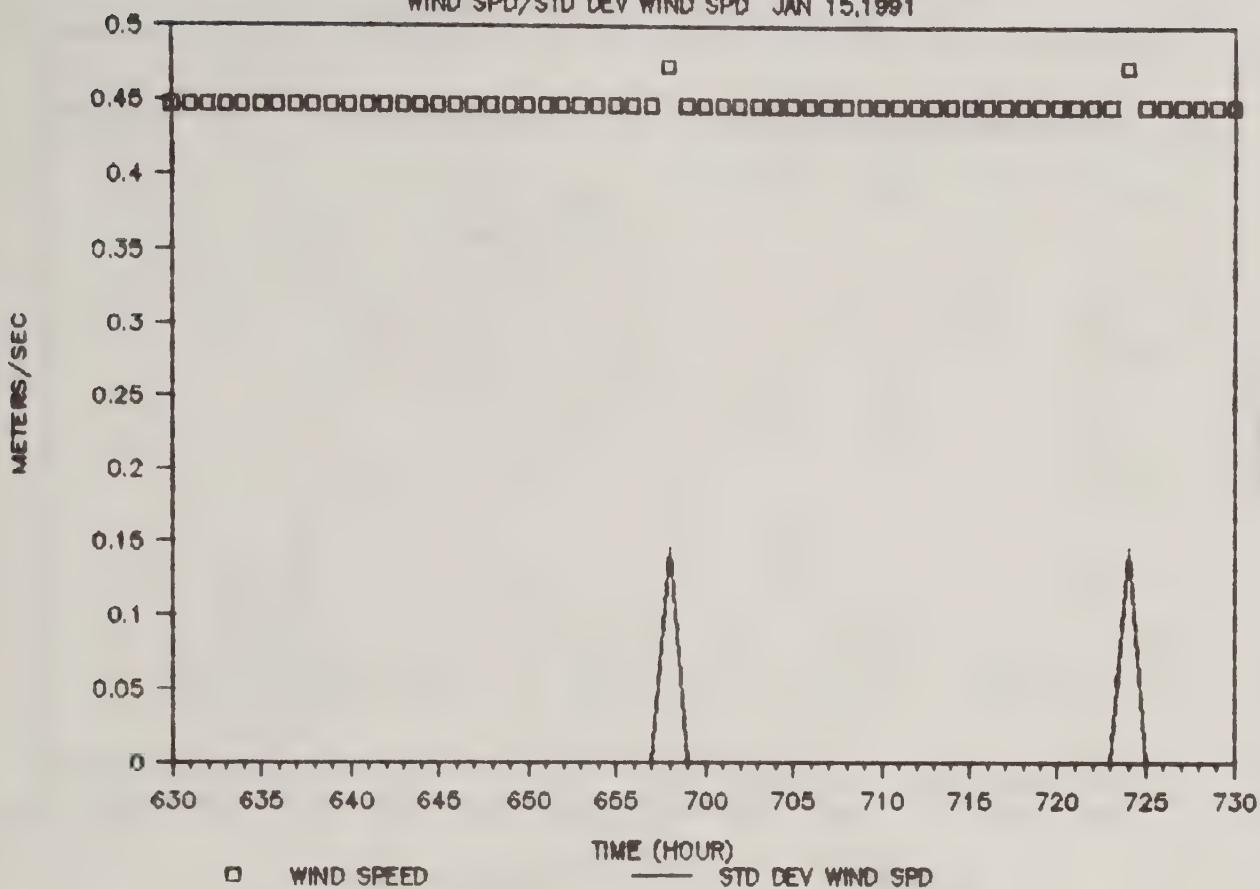
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15,1991



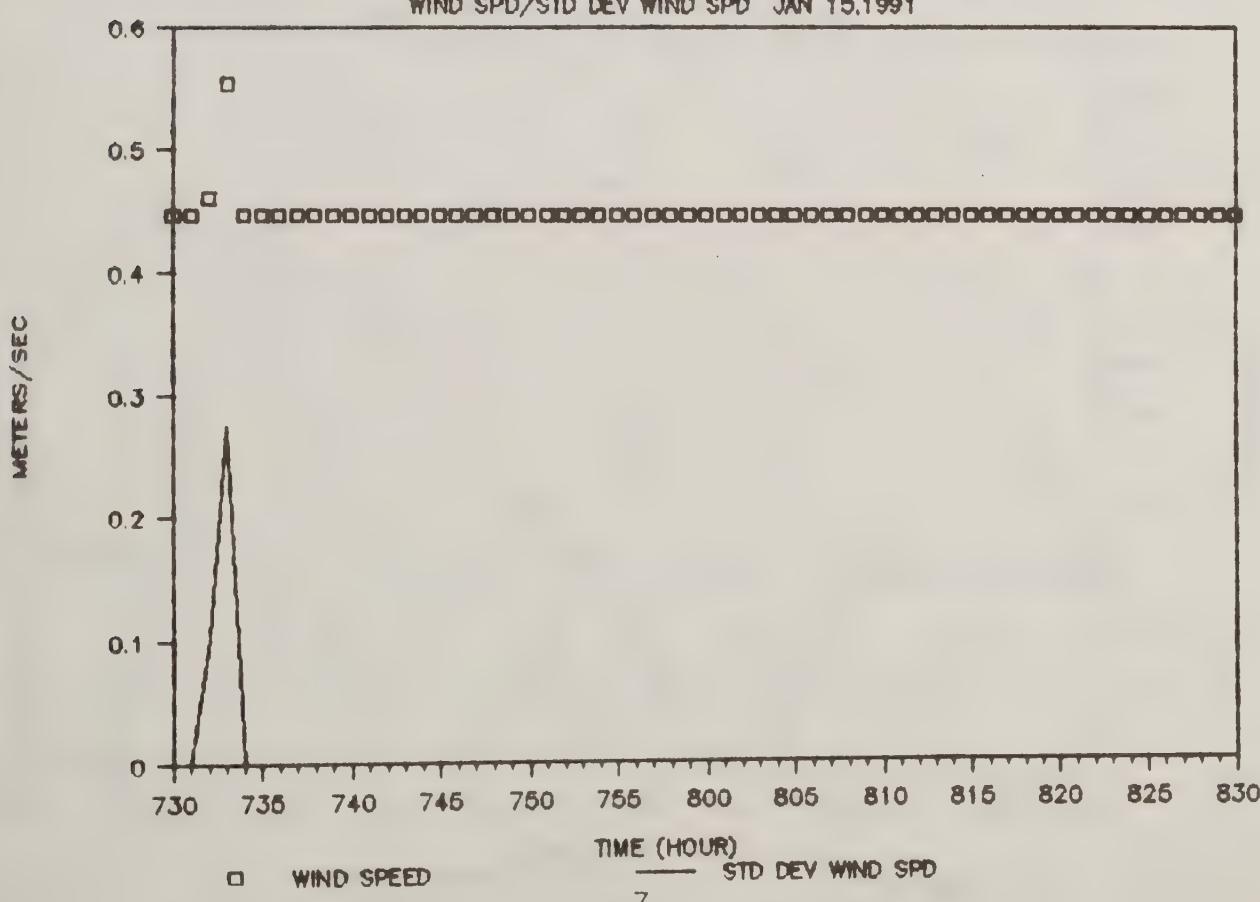
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15,1991



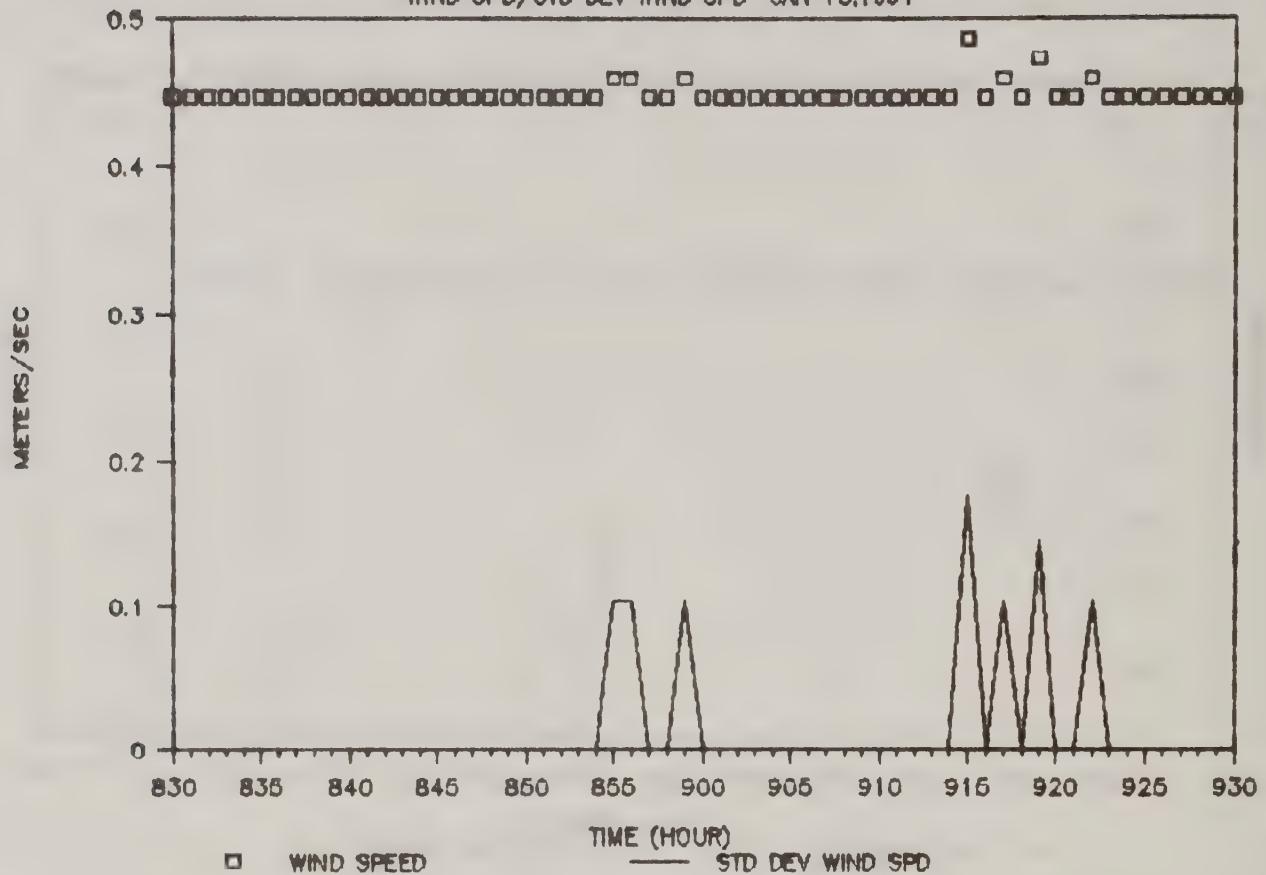
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15,1991



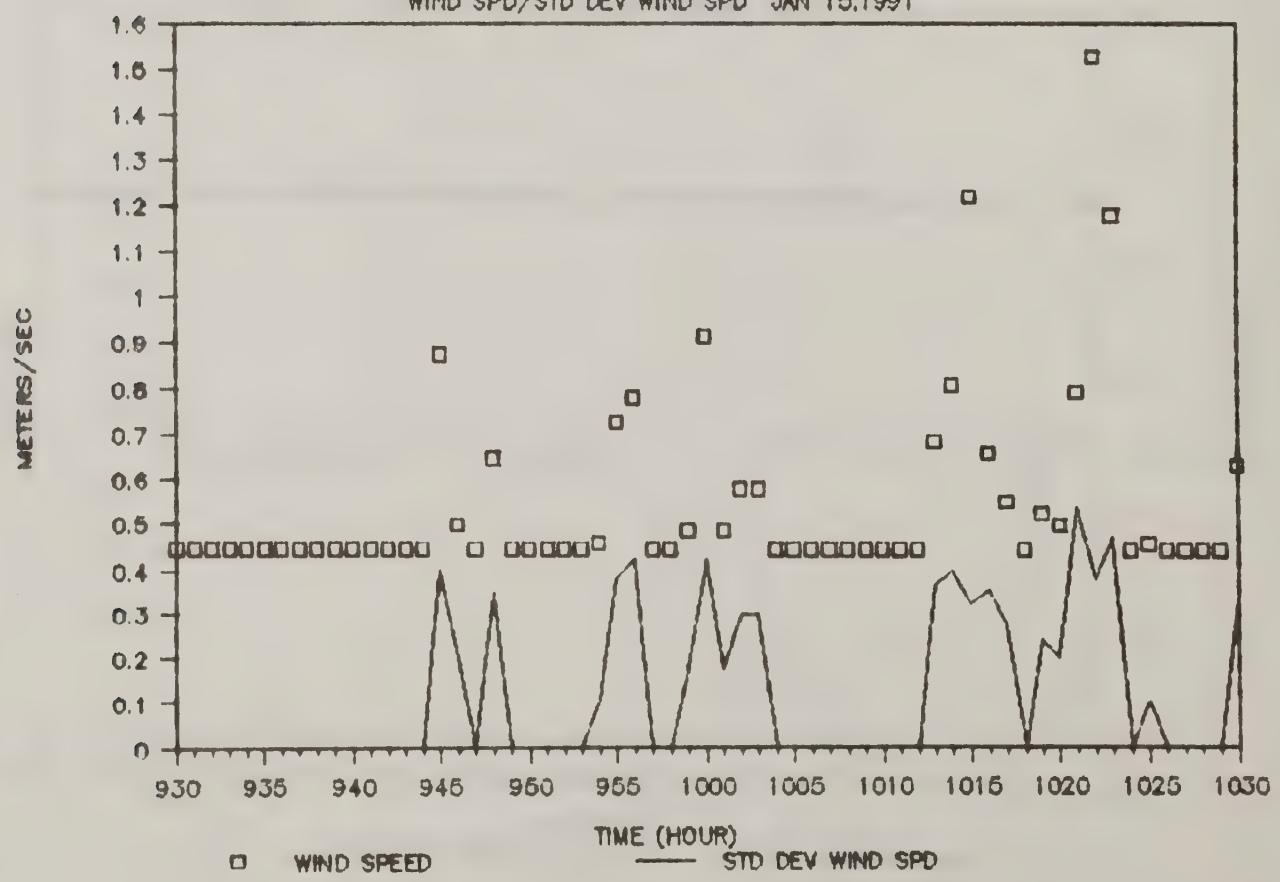
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15,1991



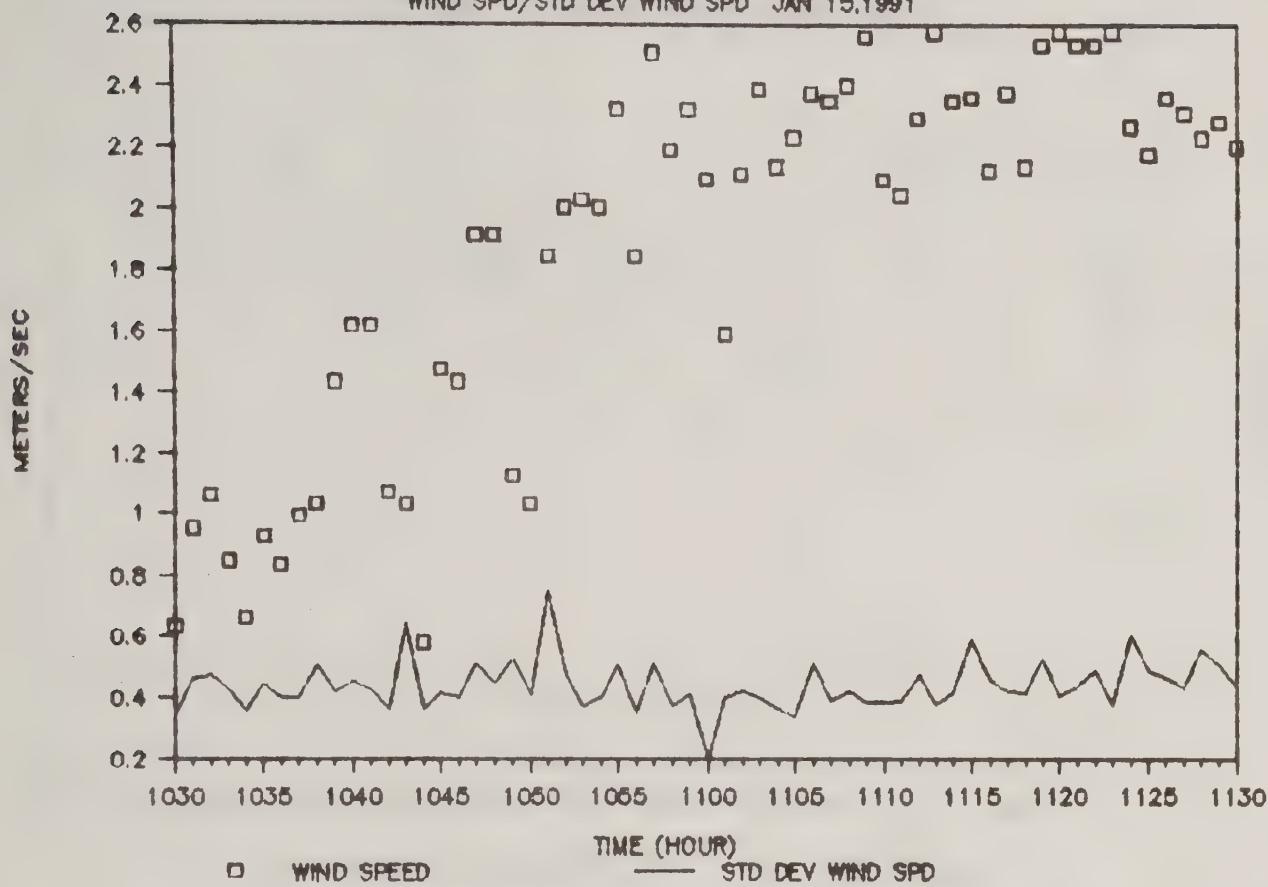
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15,1991



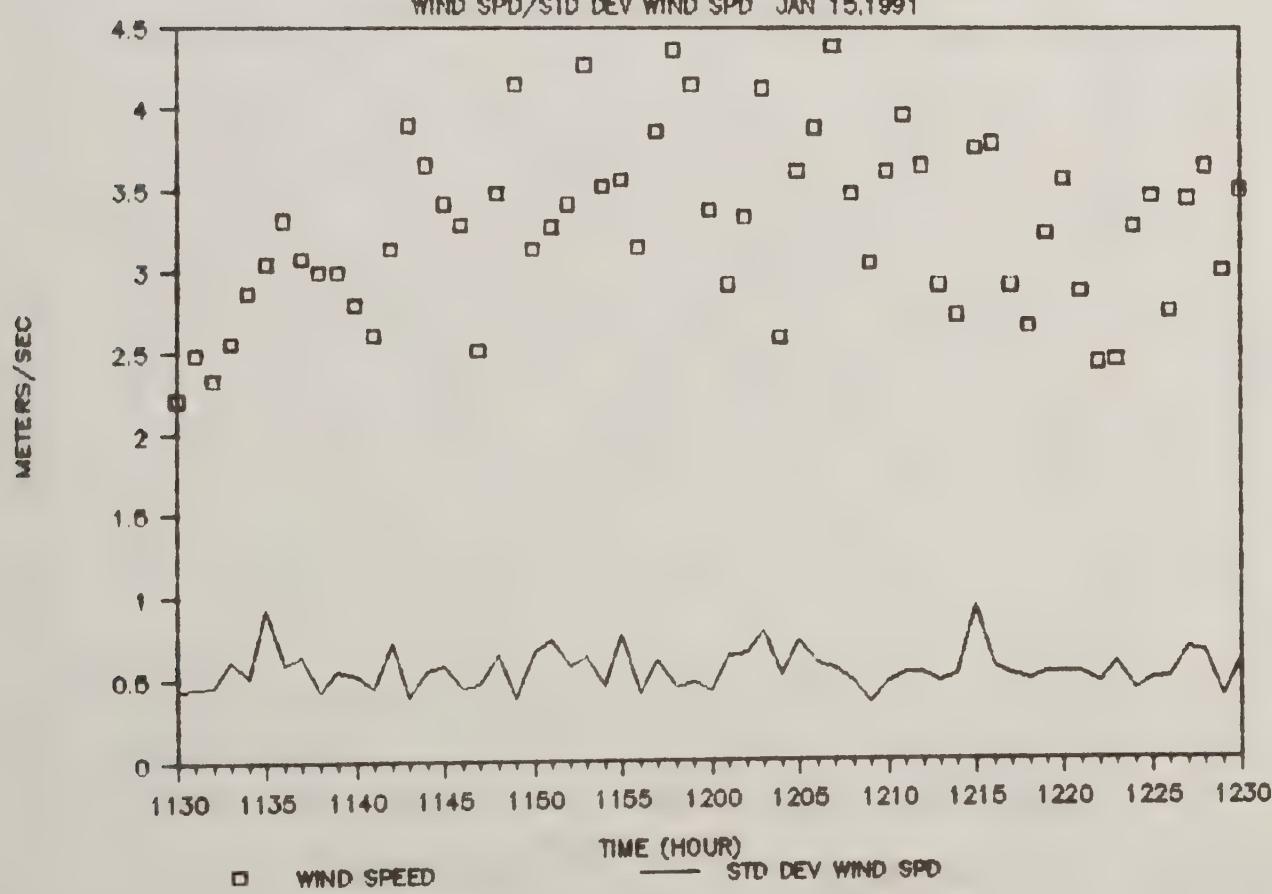
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15.1991



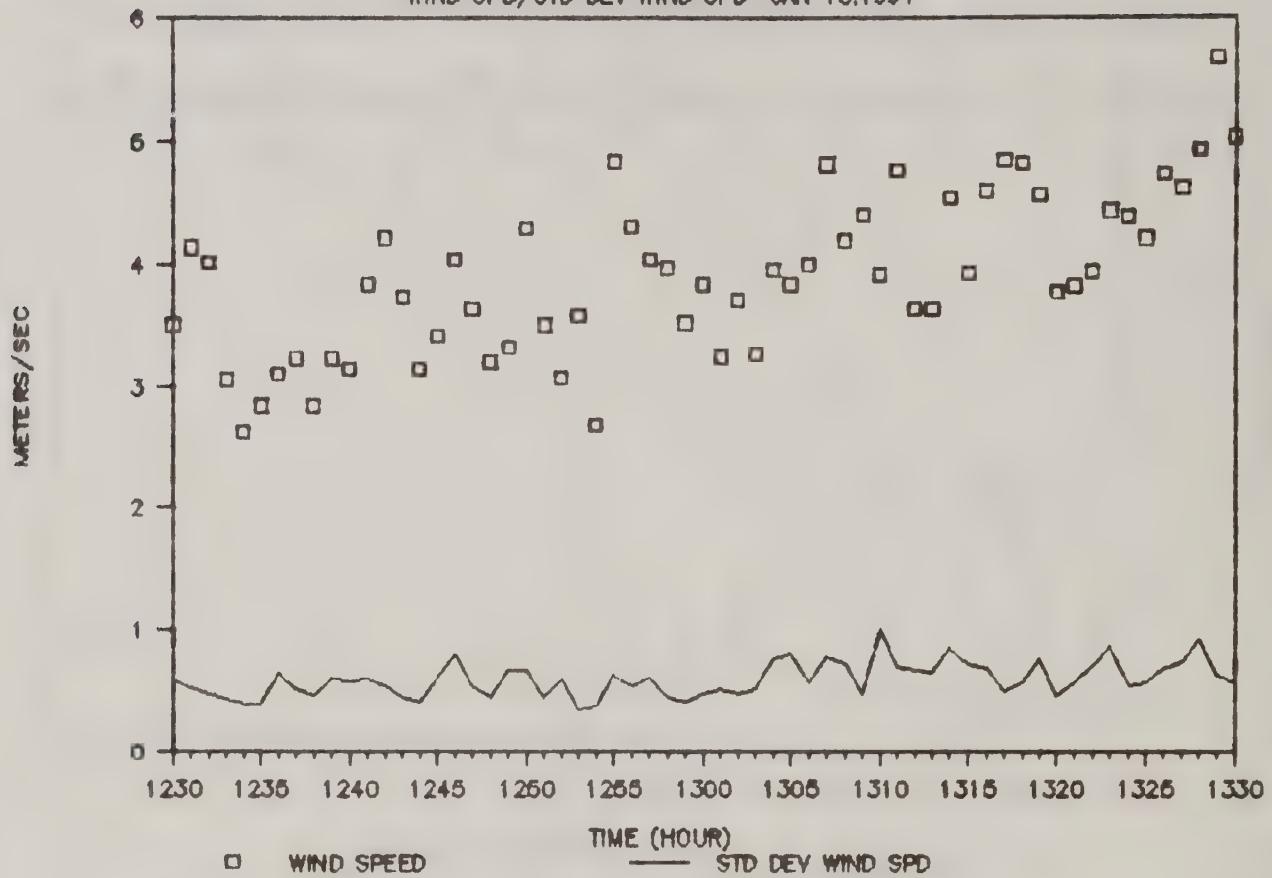
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15.1991



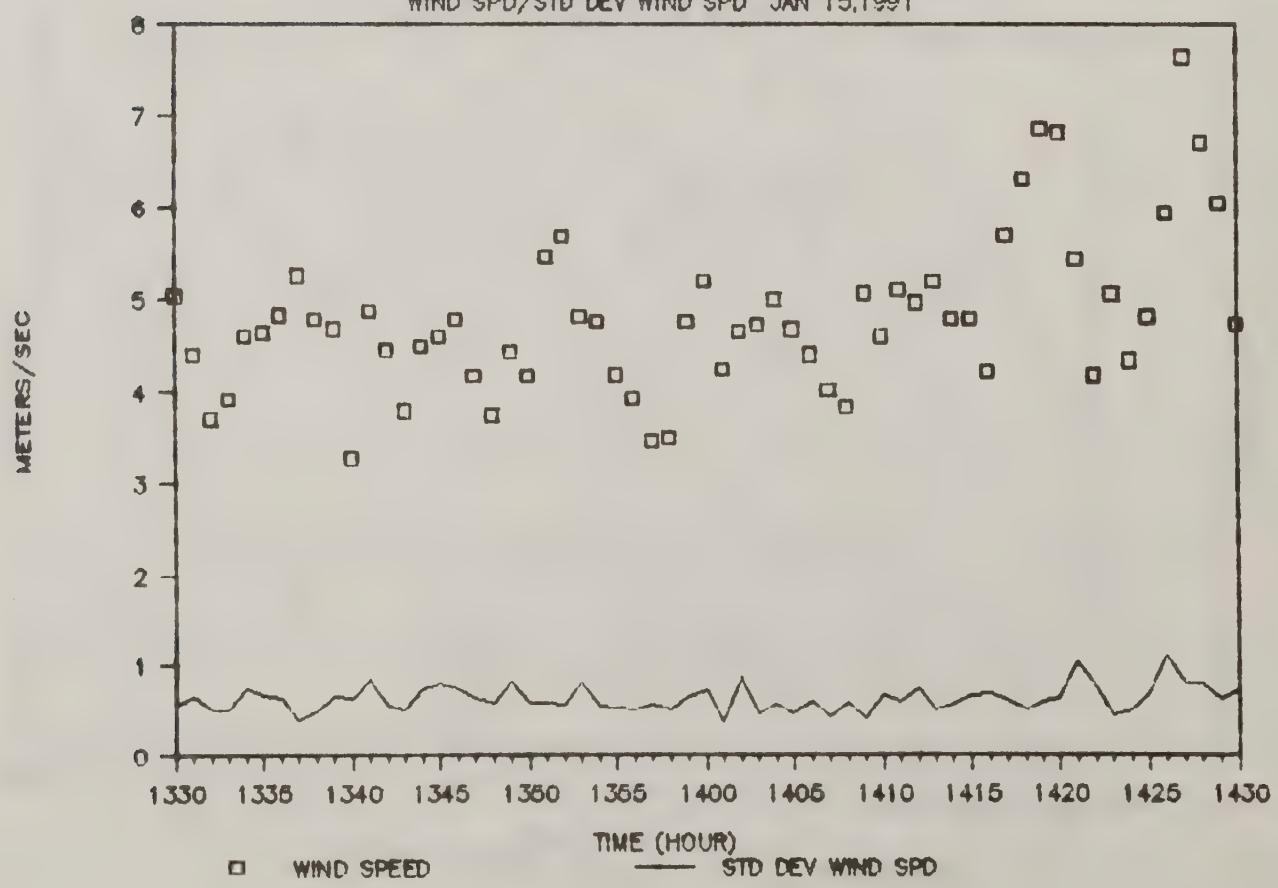
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15,1991



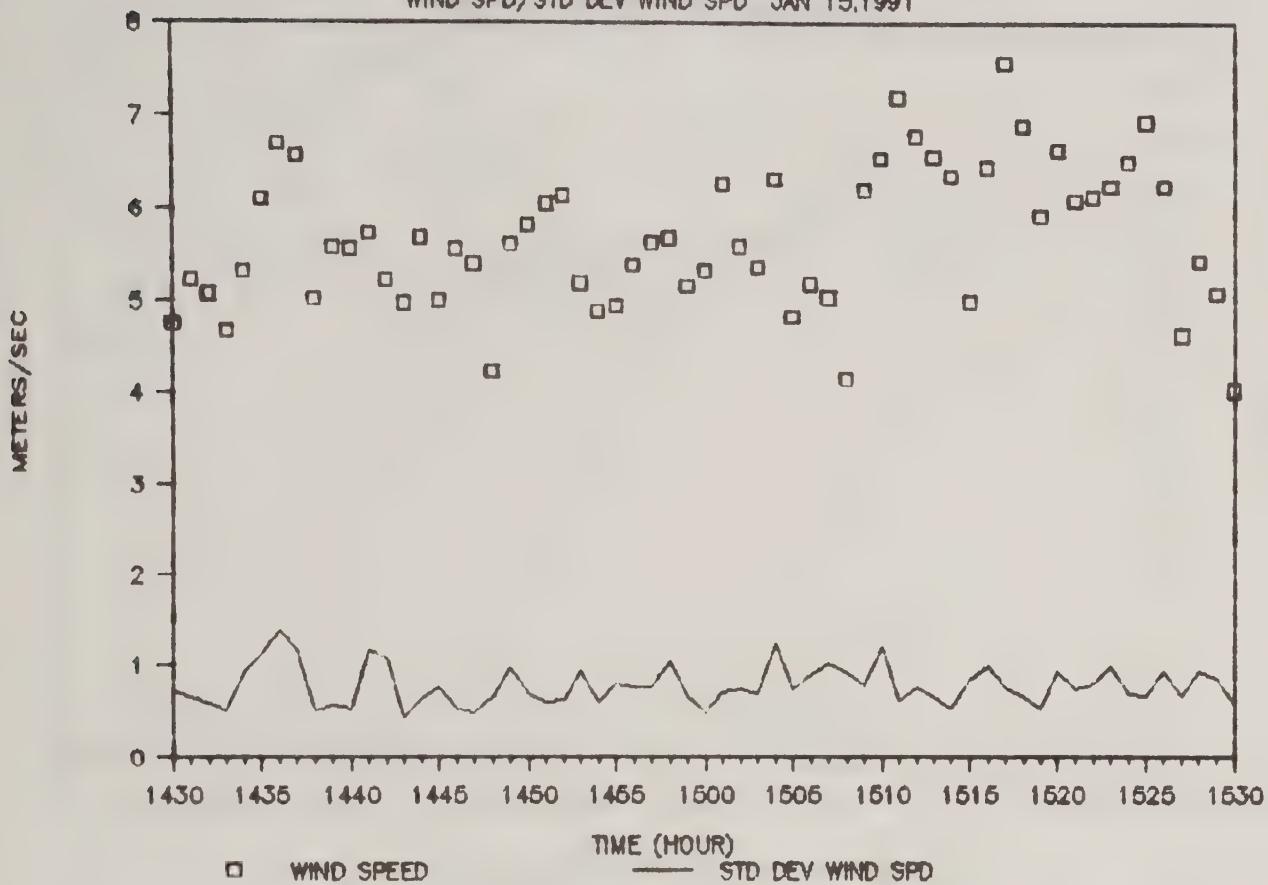
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15,1991



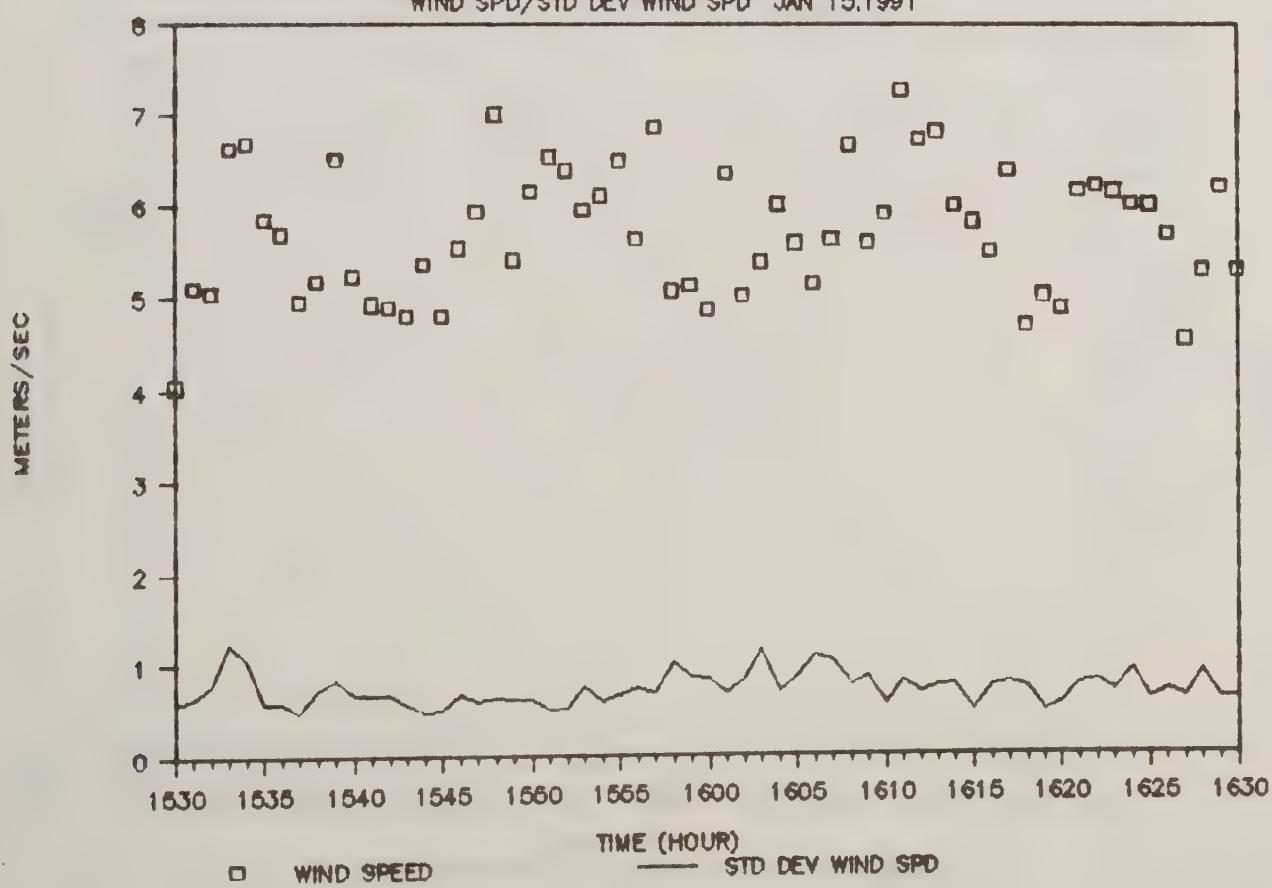
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15,1991



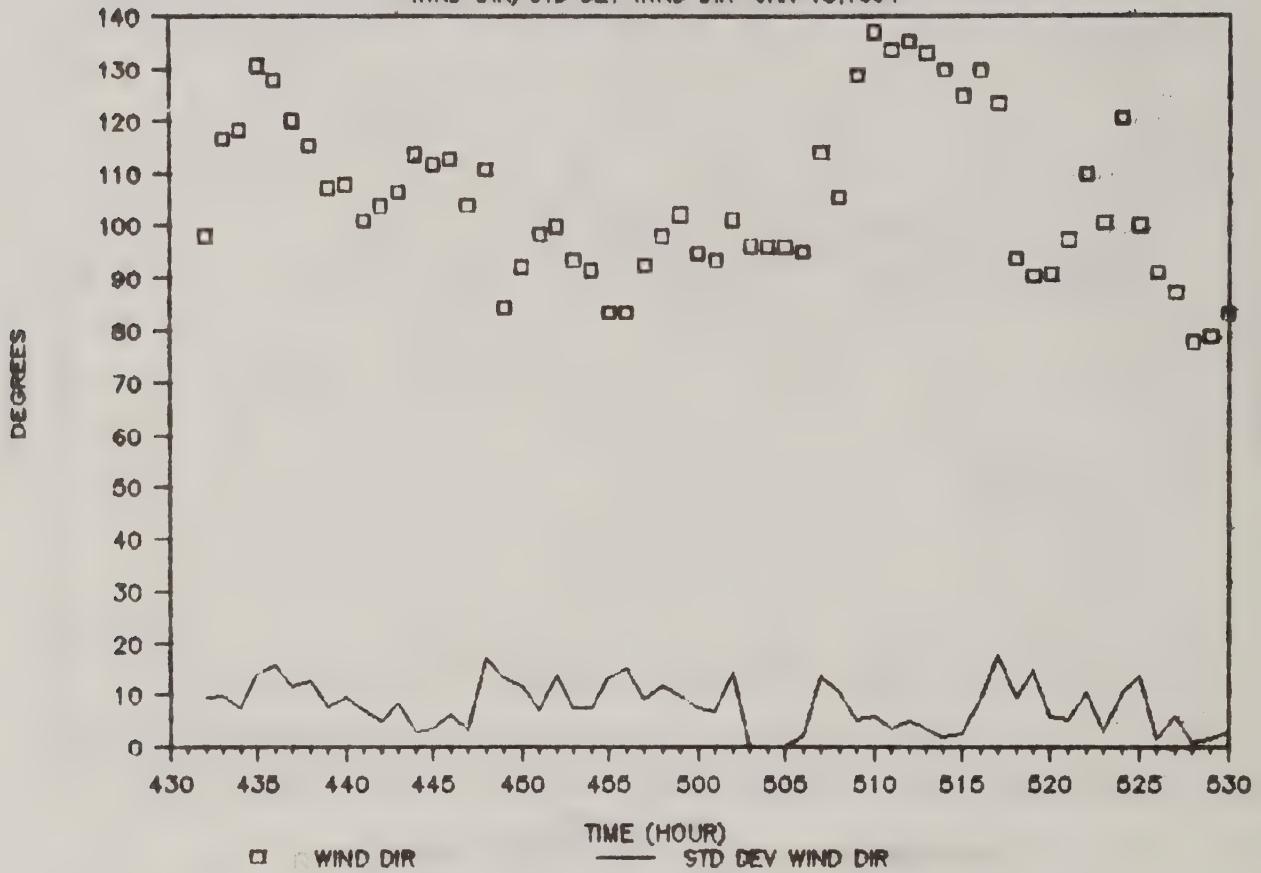
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 15,1991



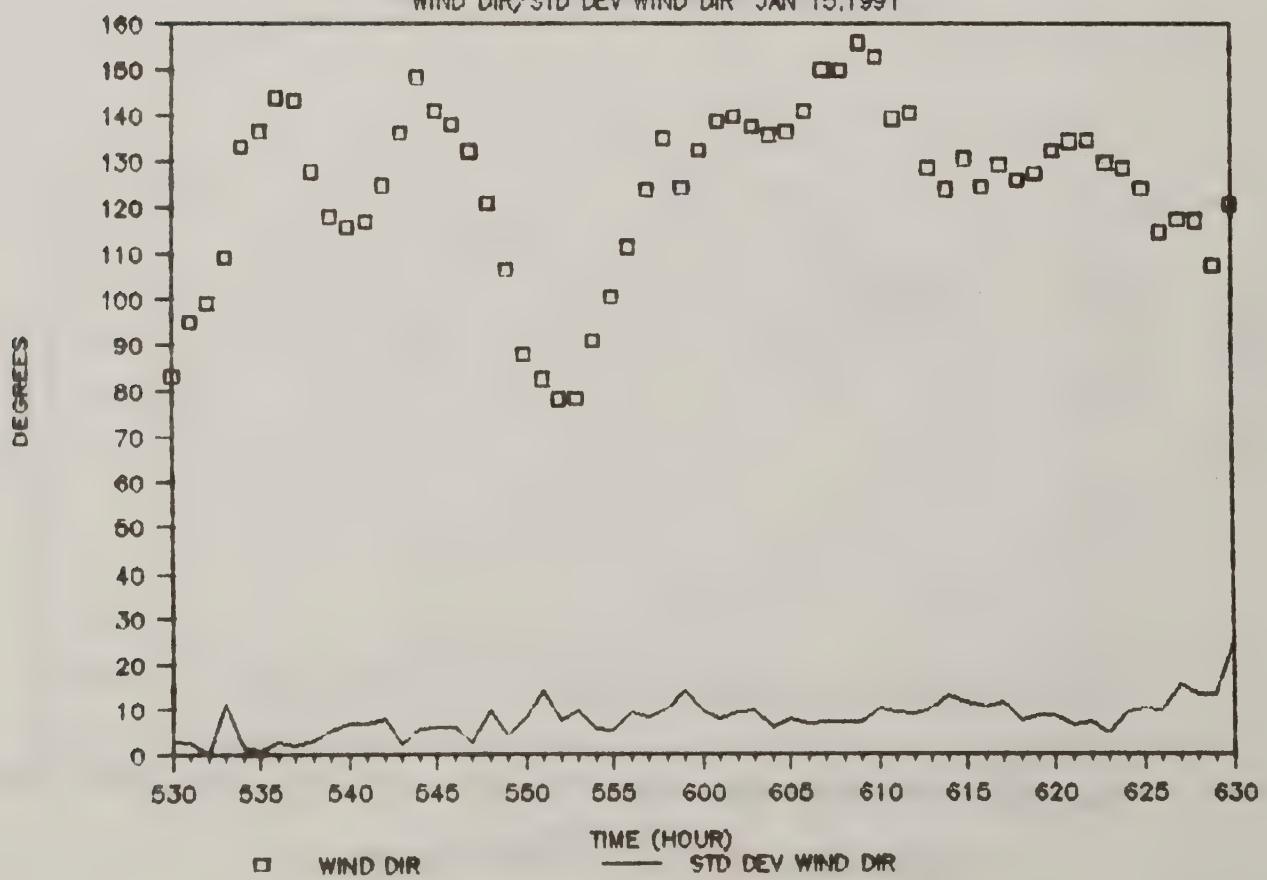
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



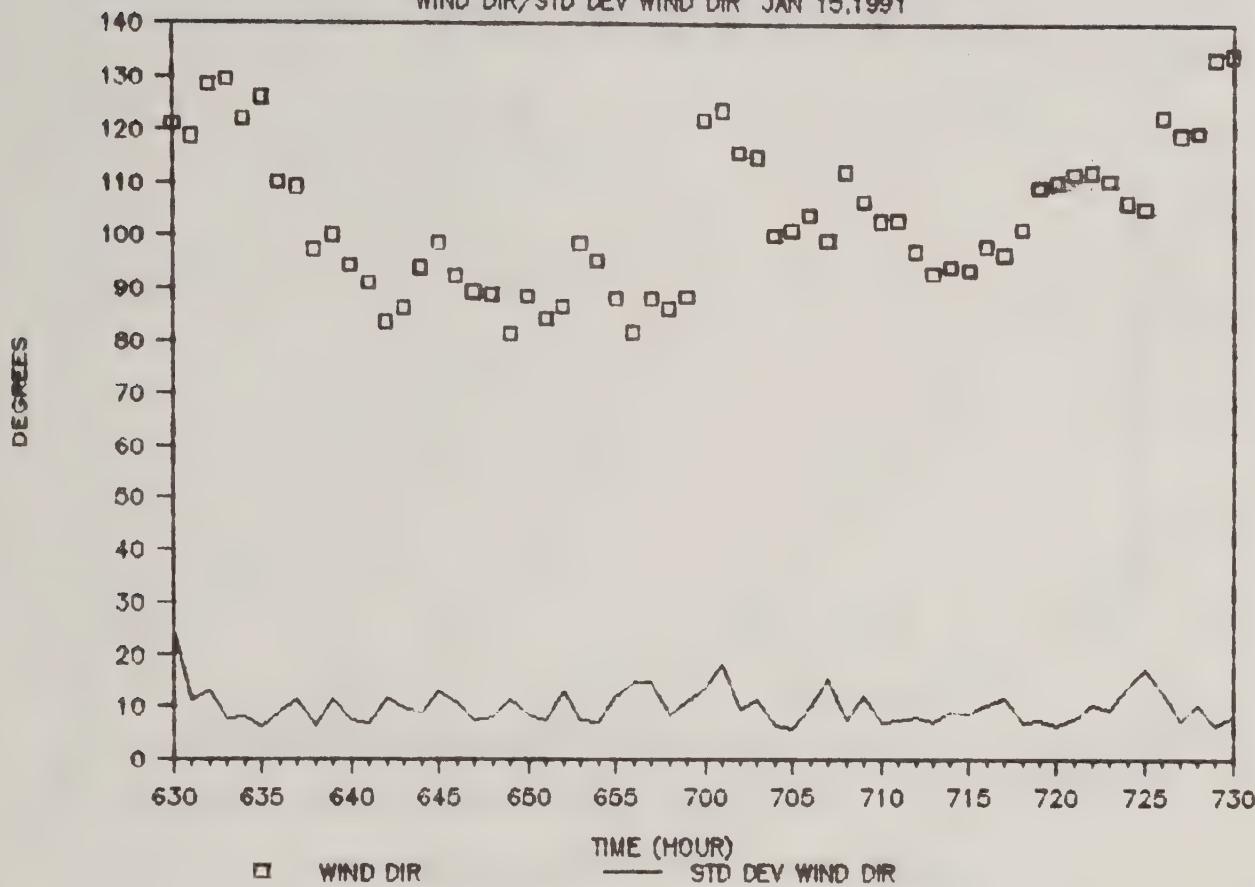
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



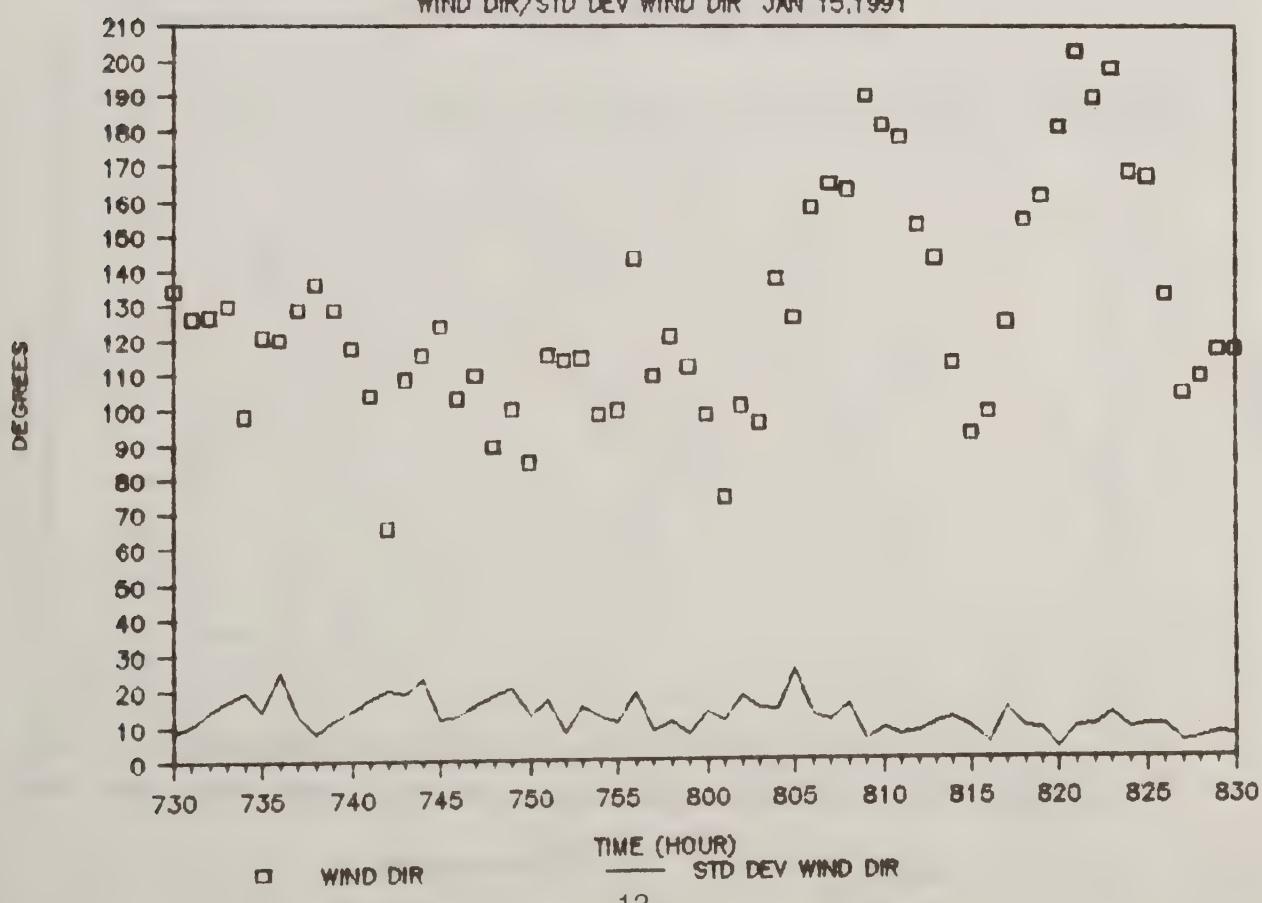
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



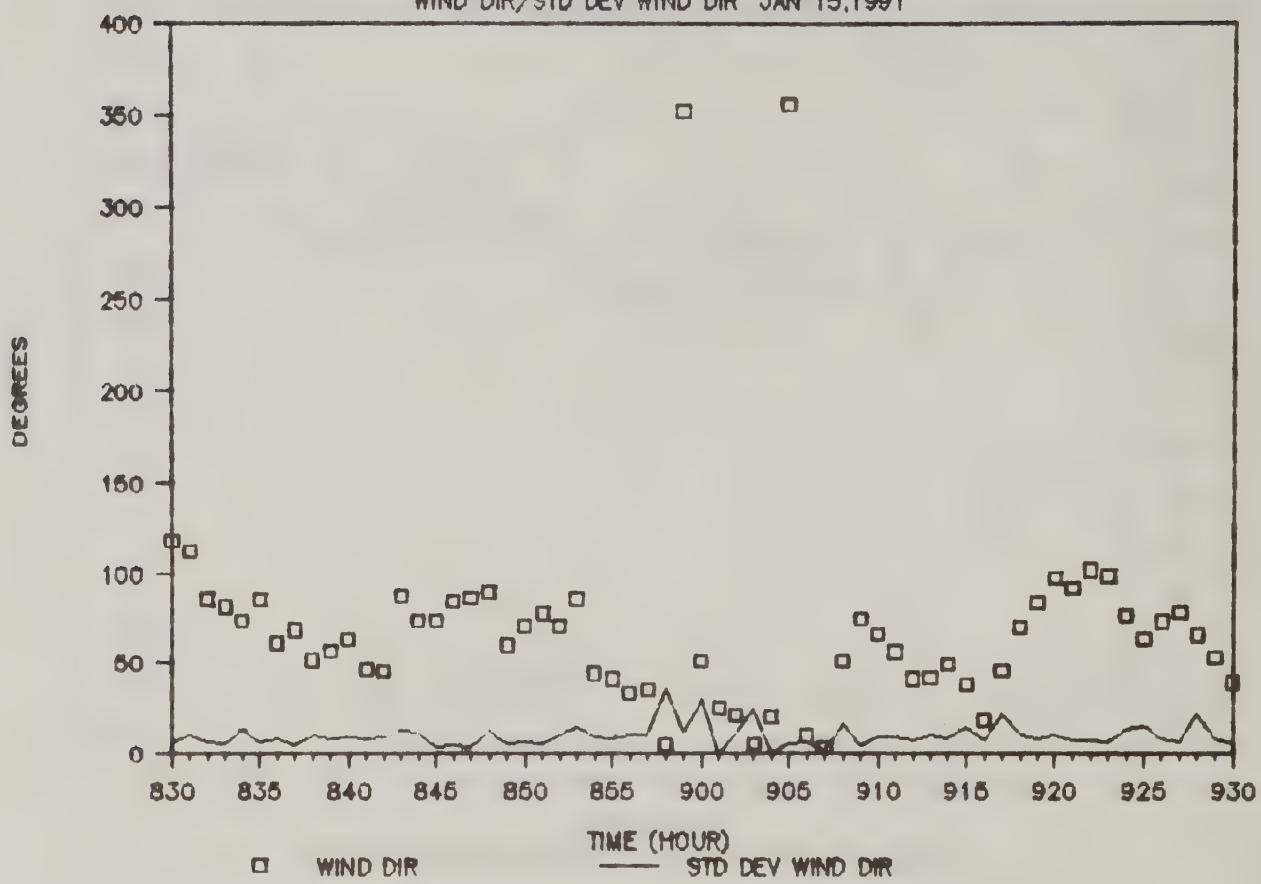
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



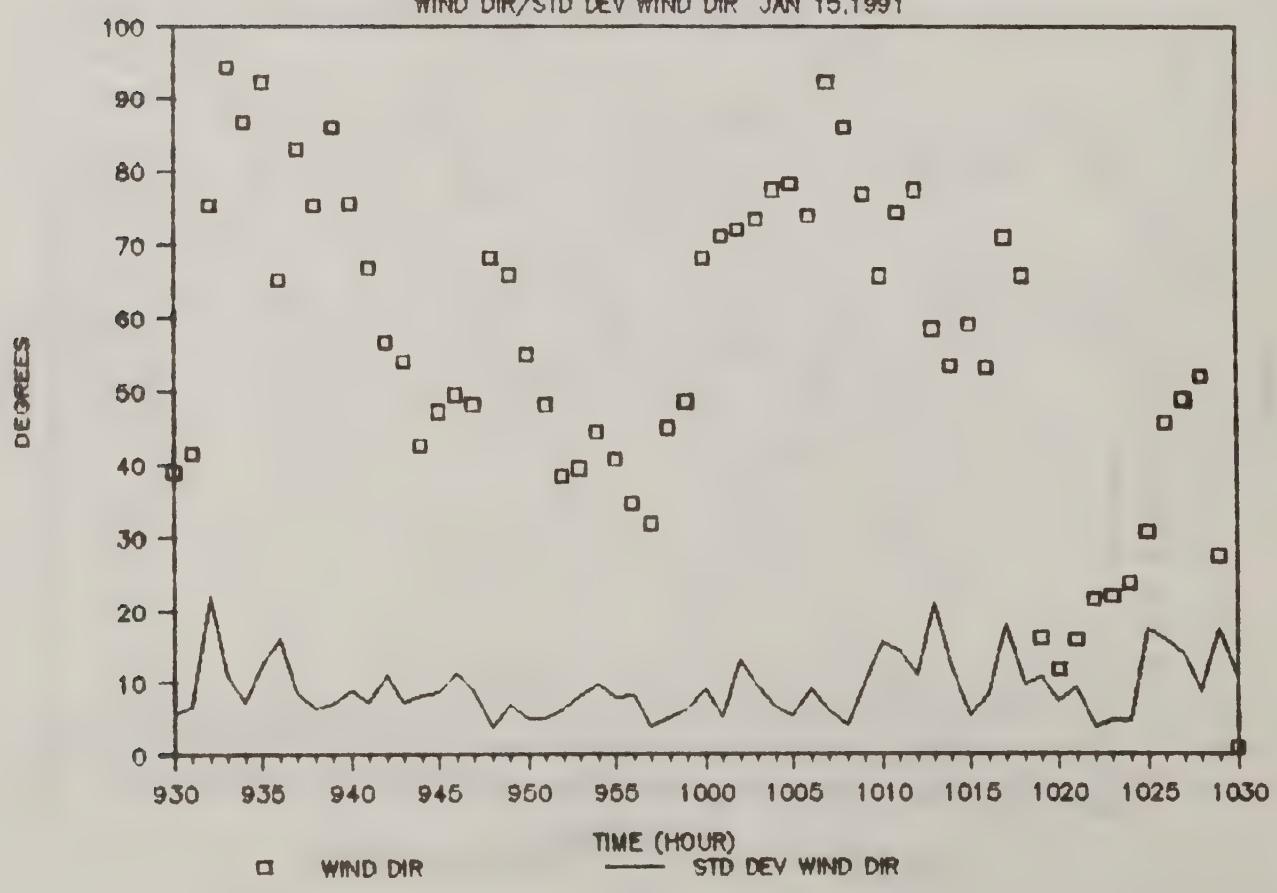
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



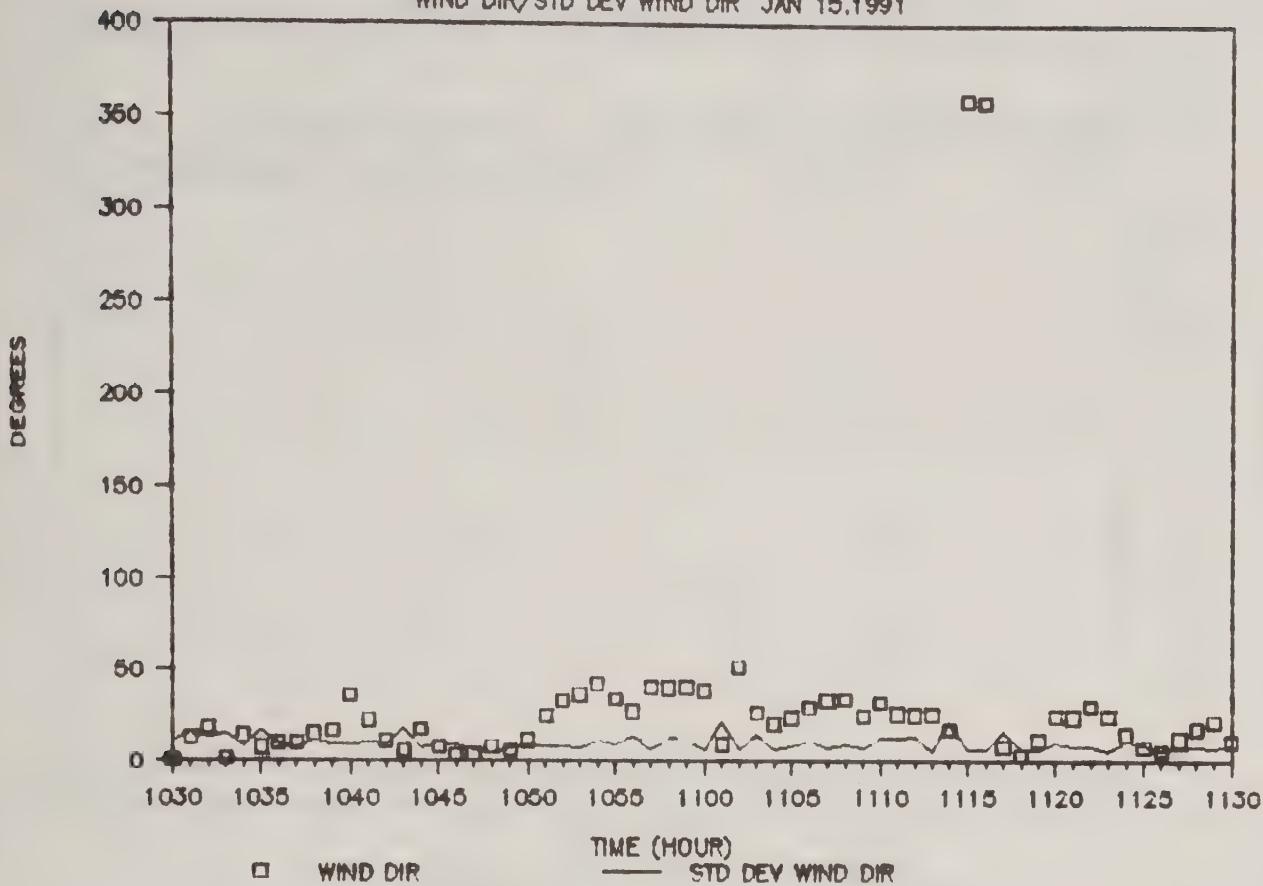
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



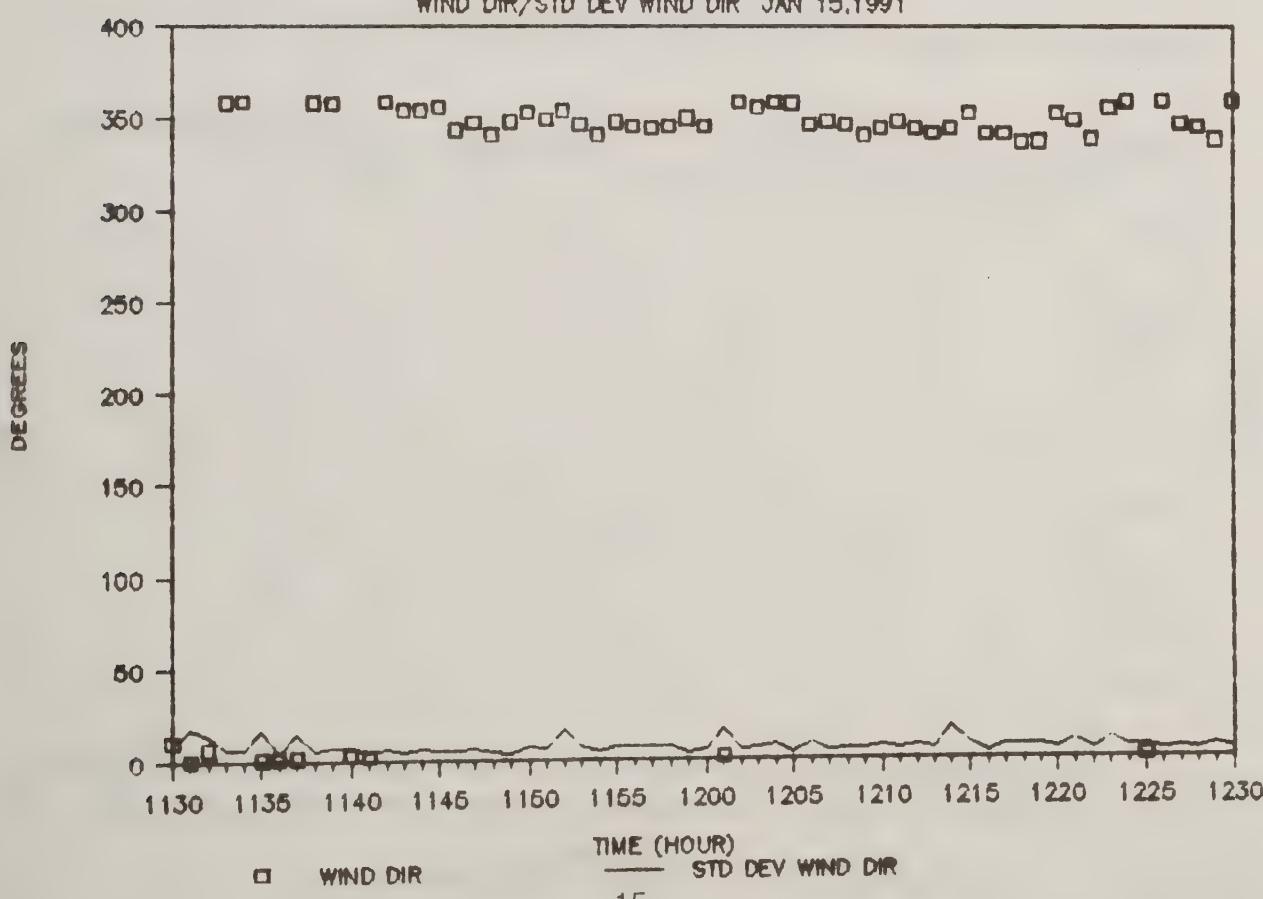
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



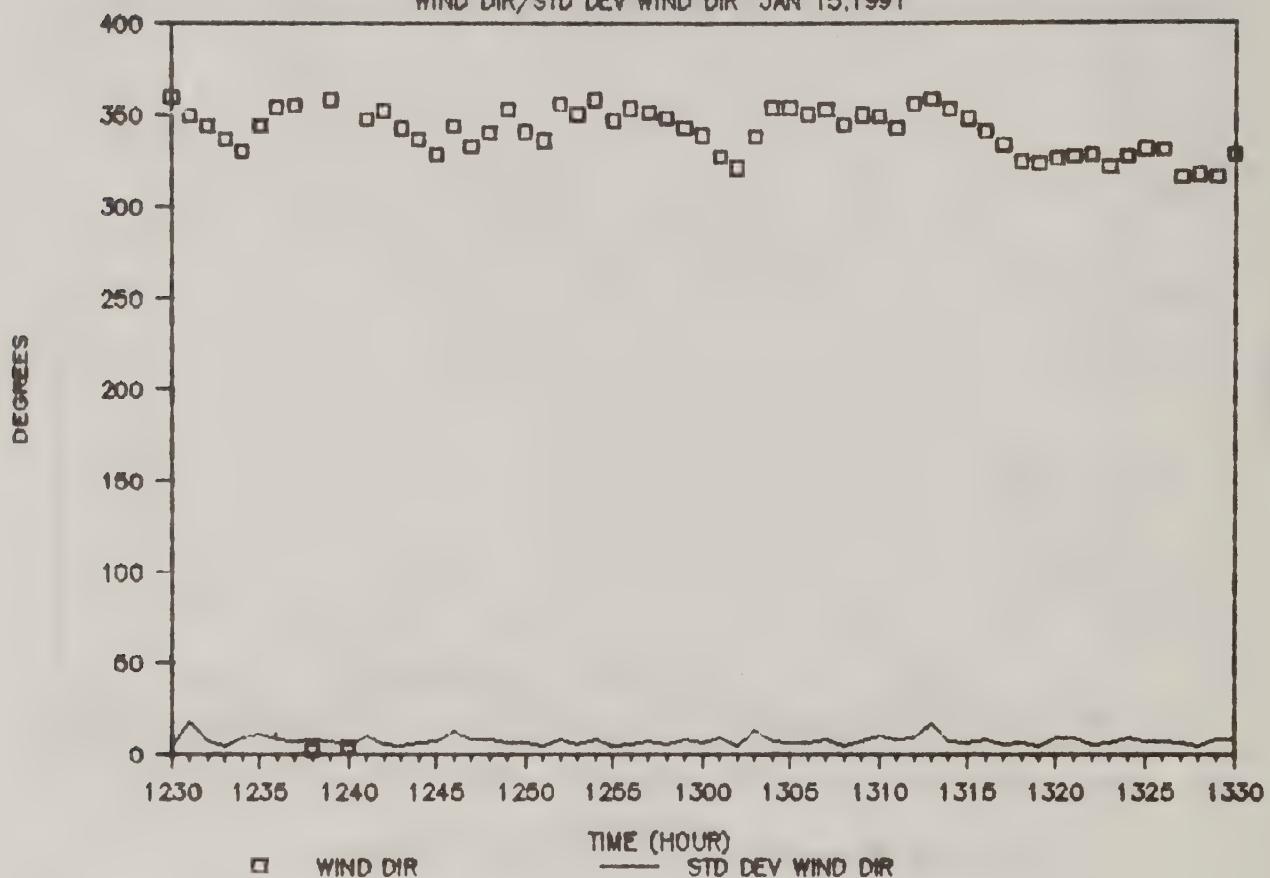
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



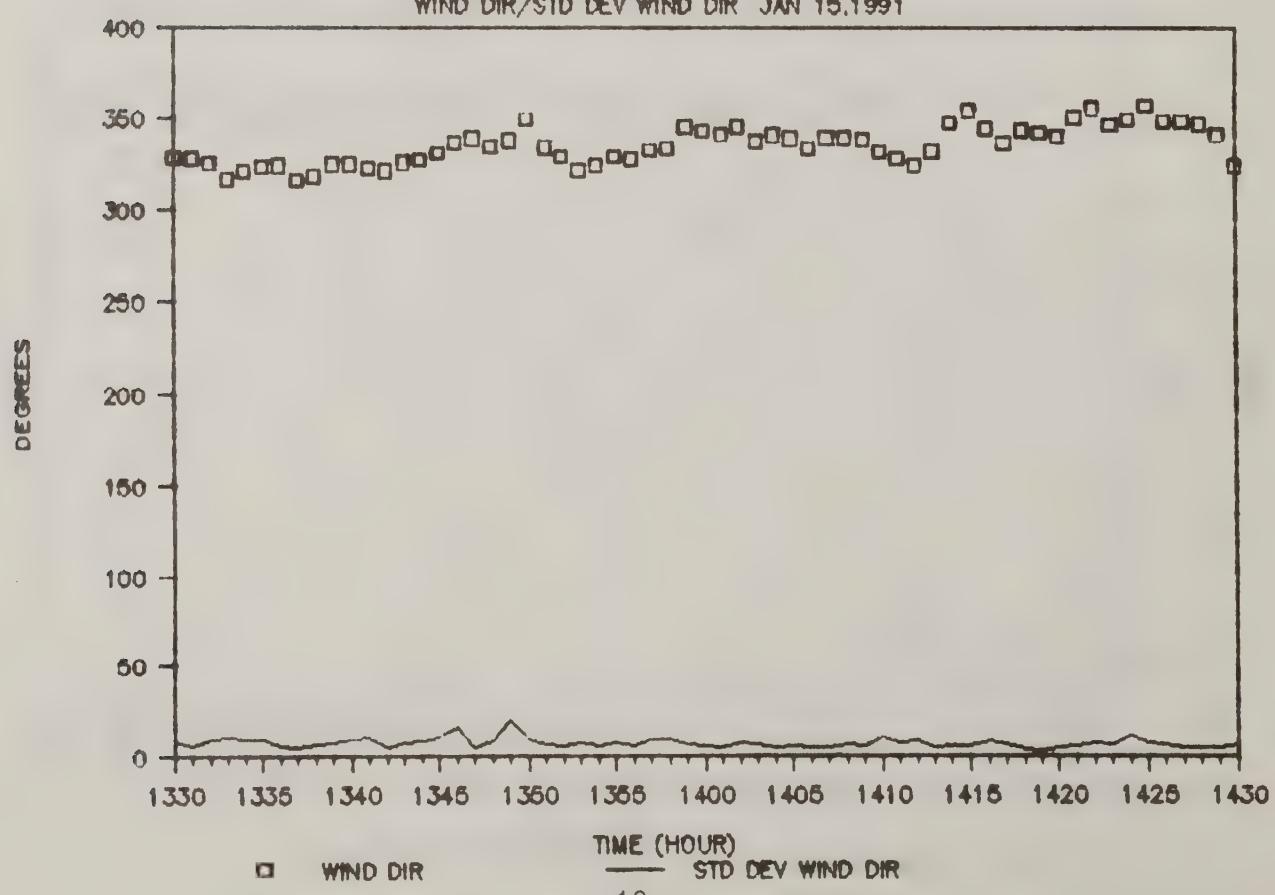
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



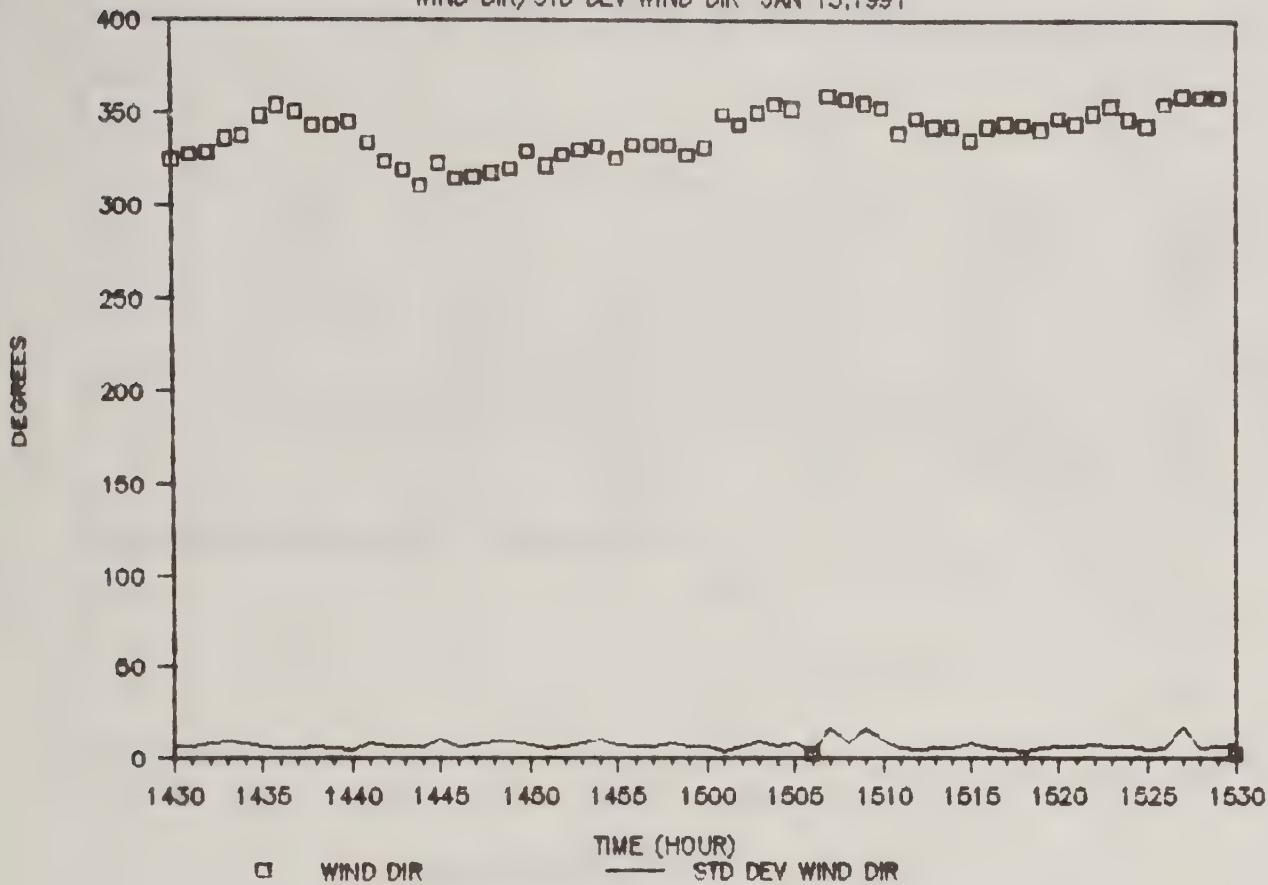
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



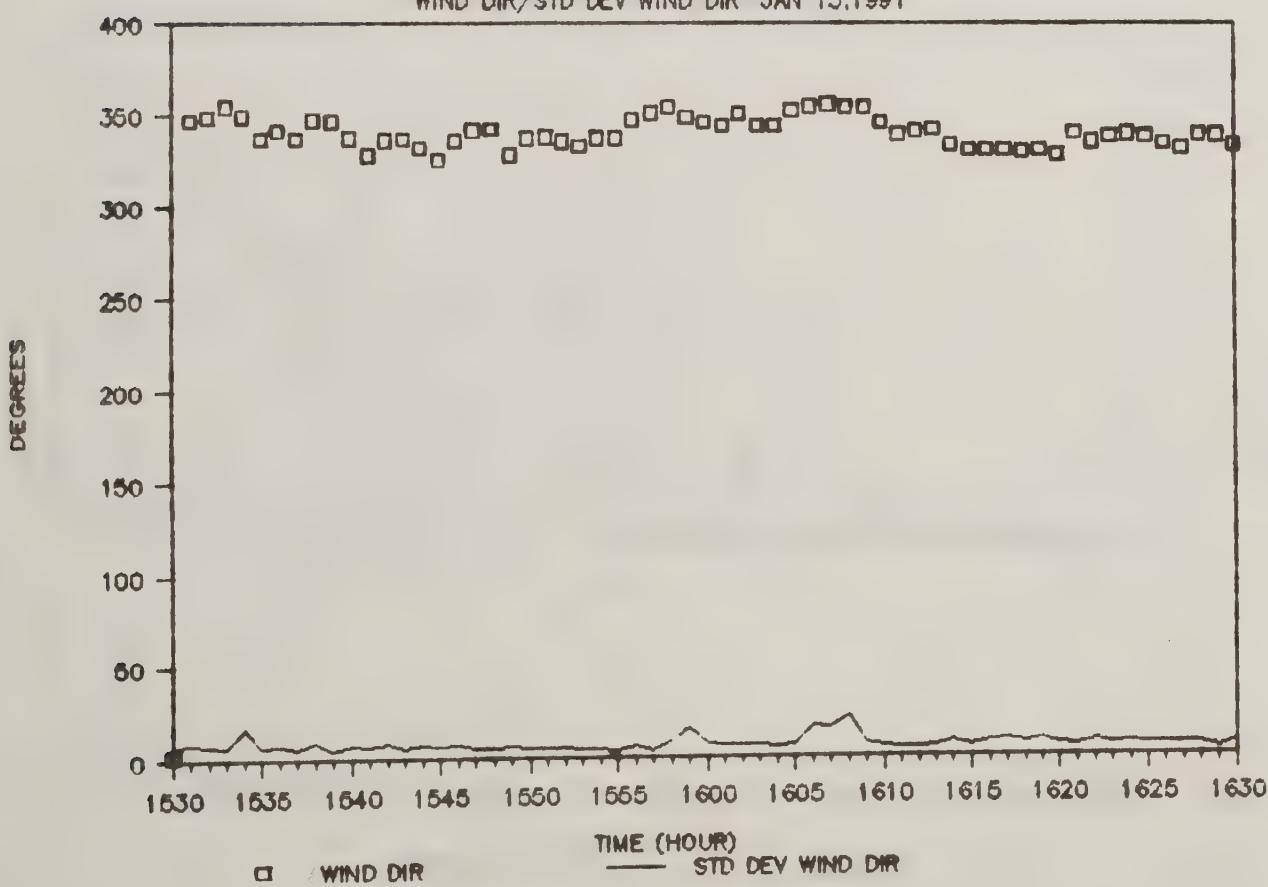
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



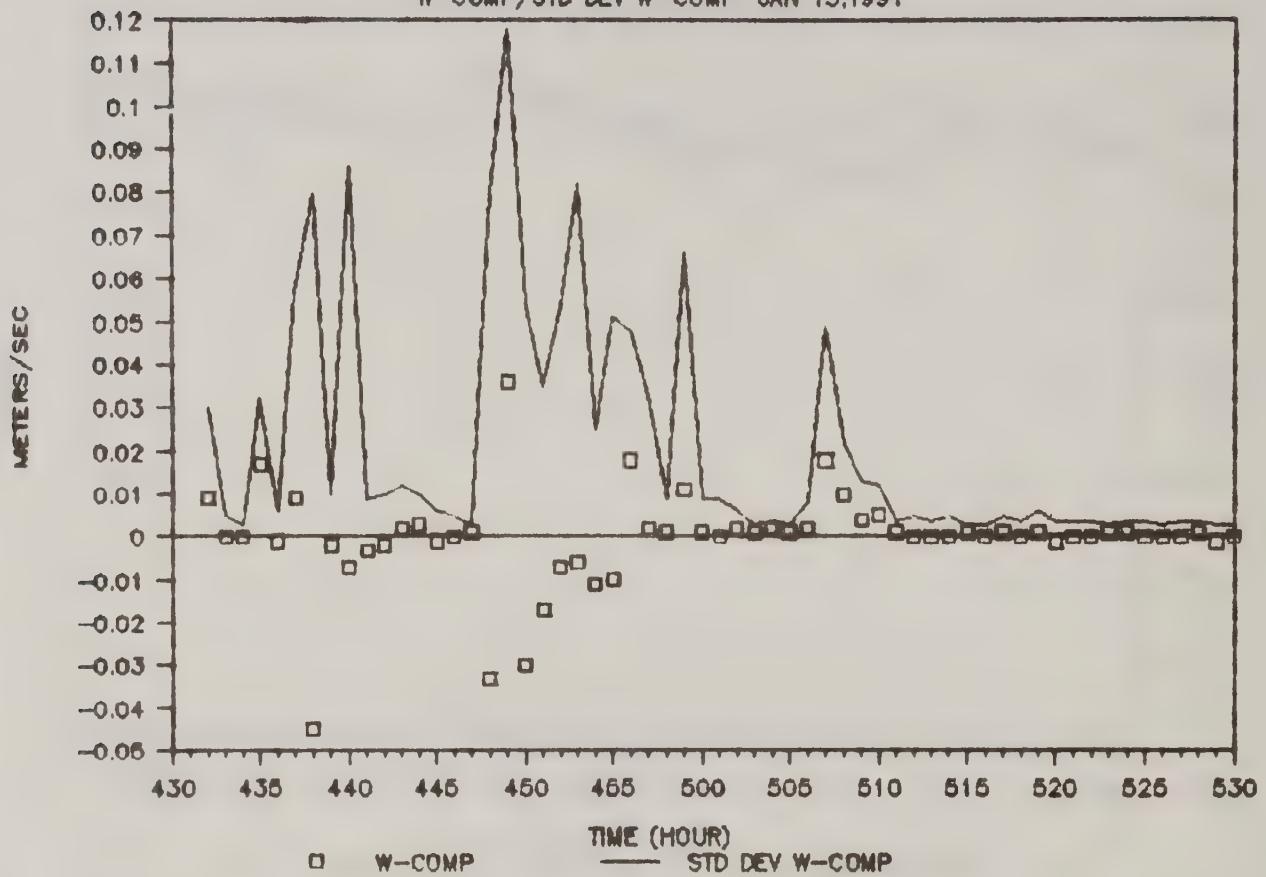
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 15,1991



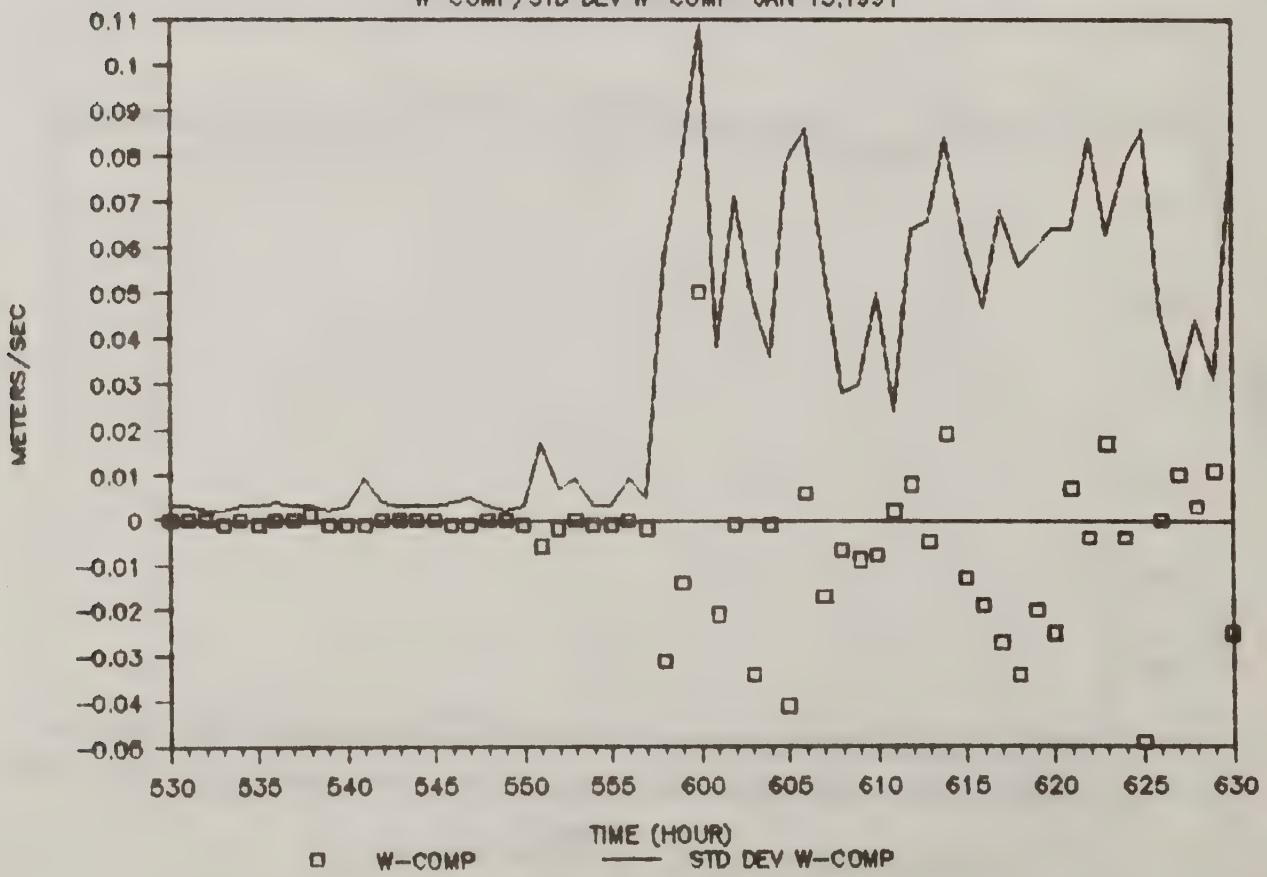
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



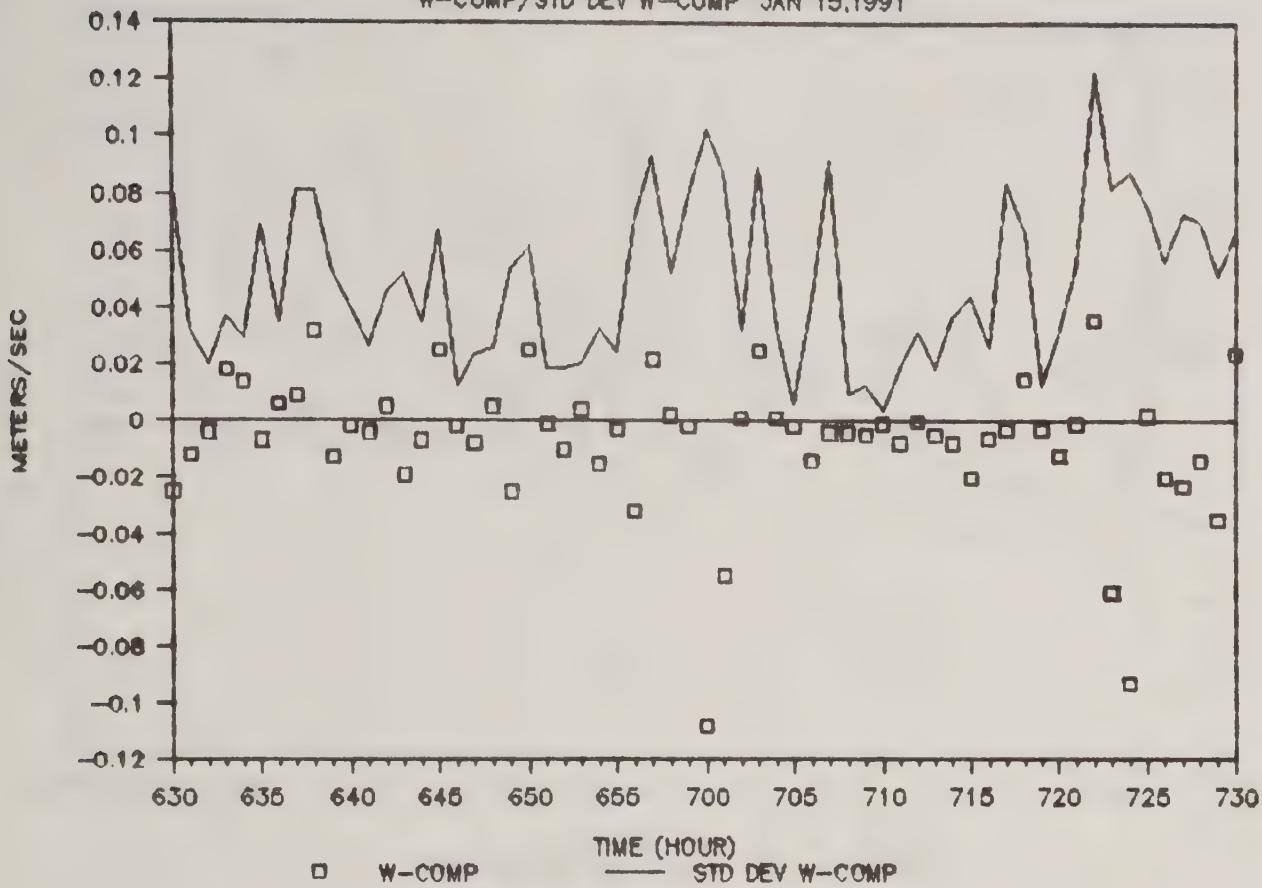
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



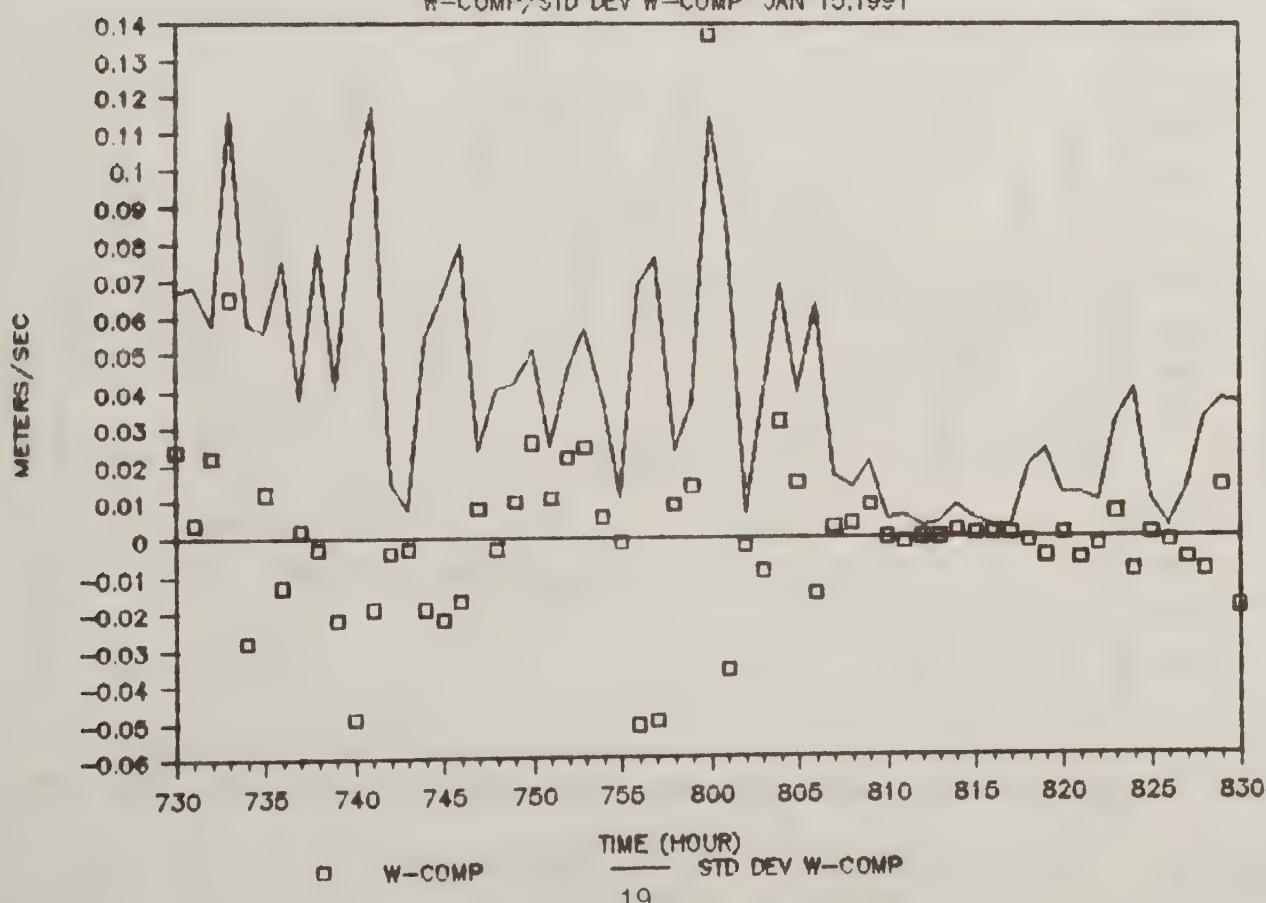
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



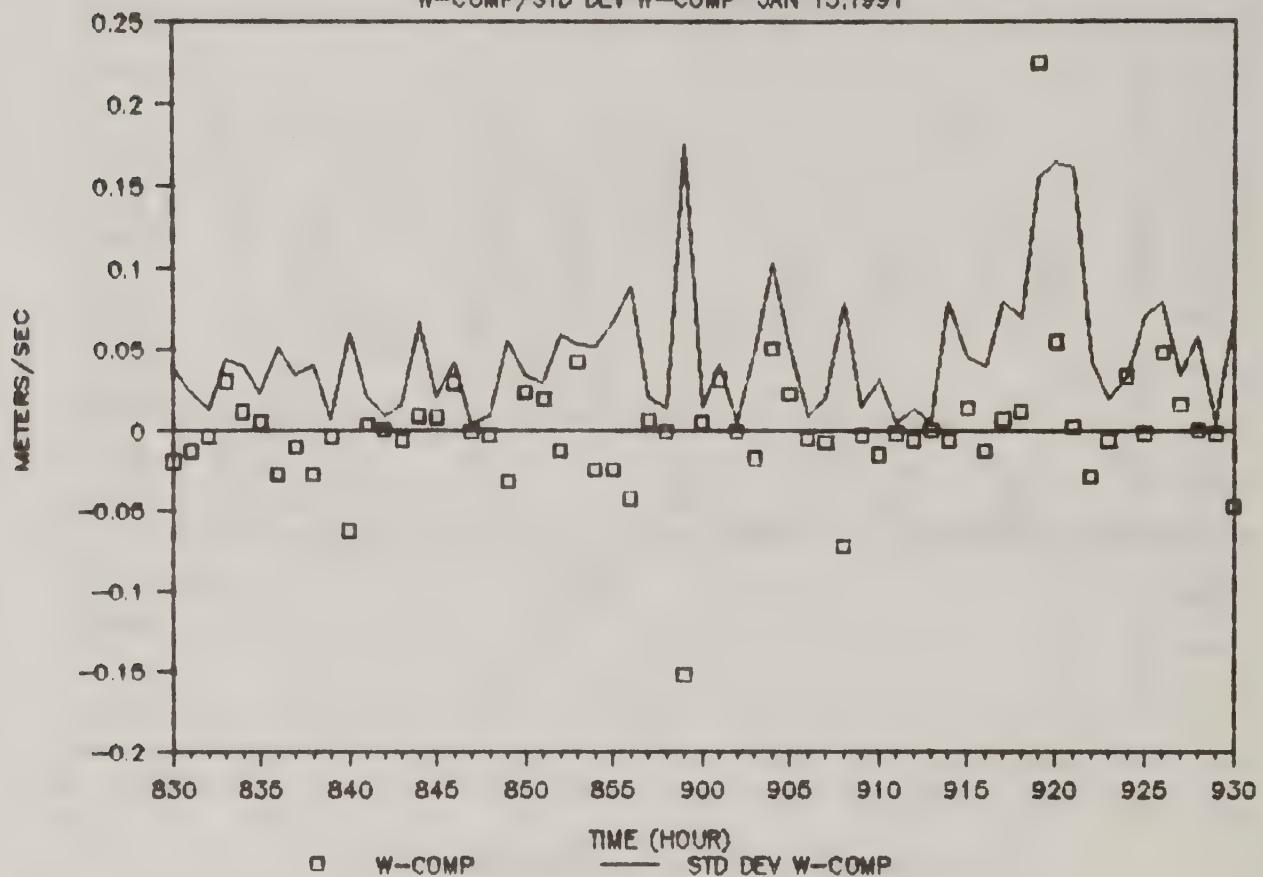
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



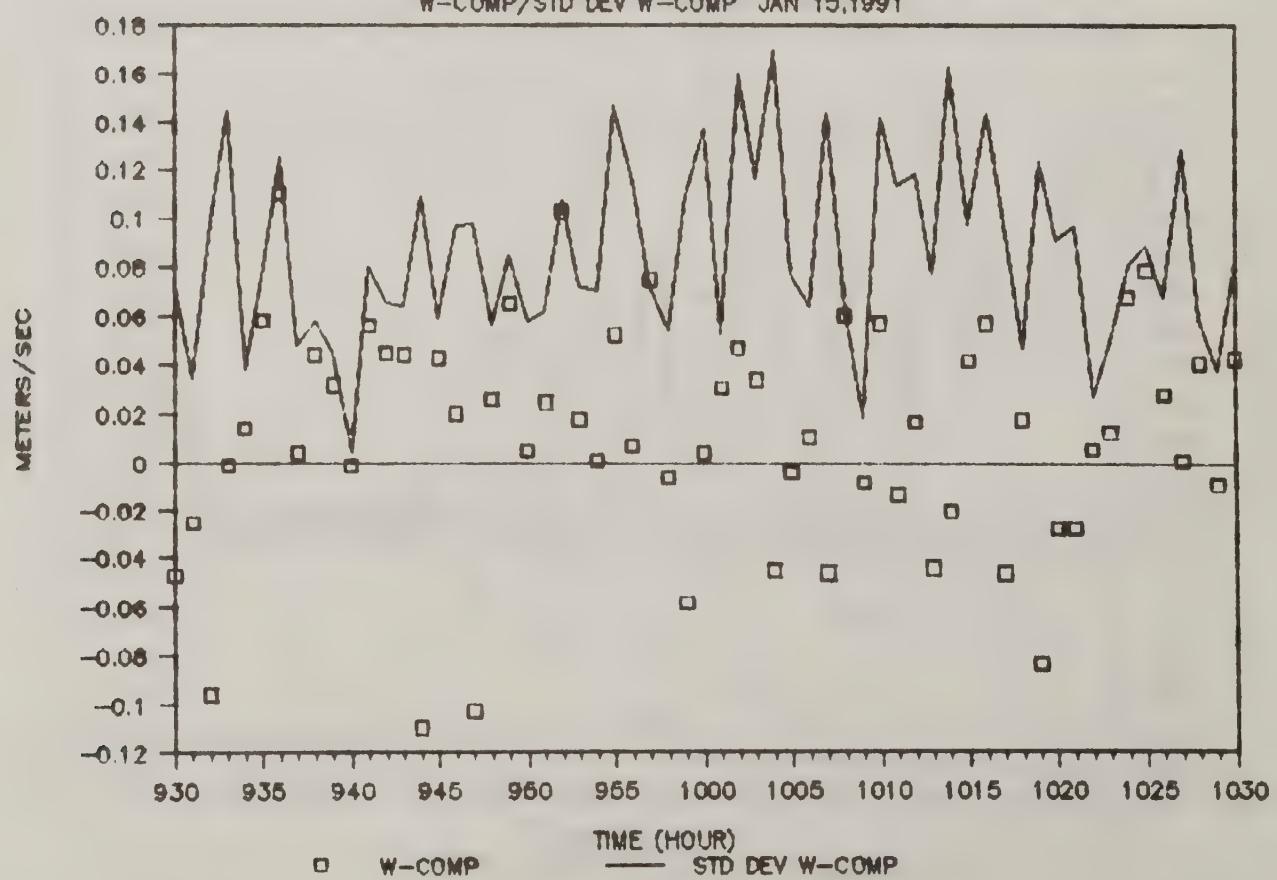
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



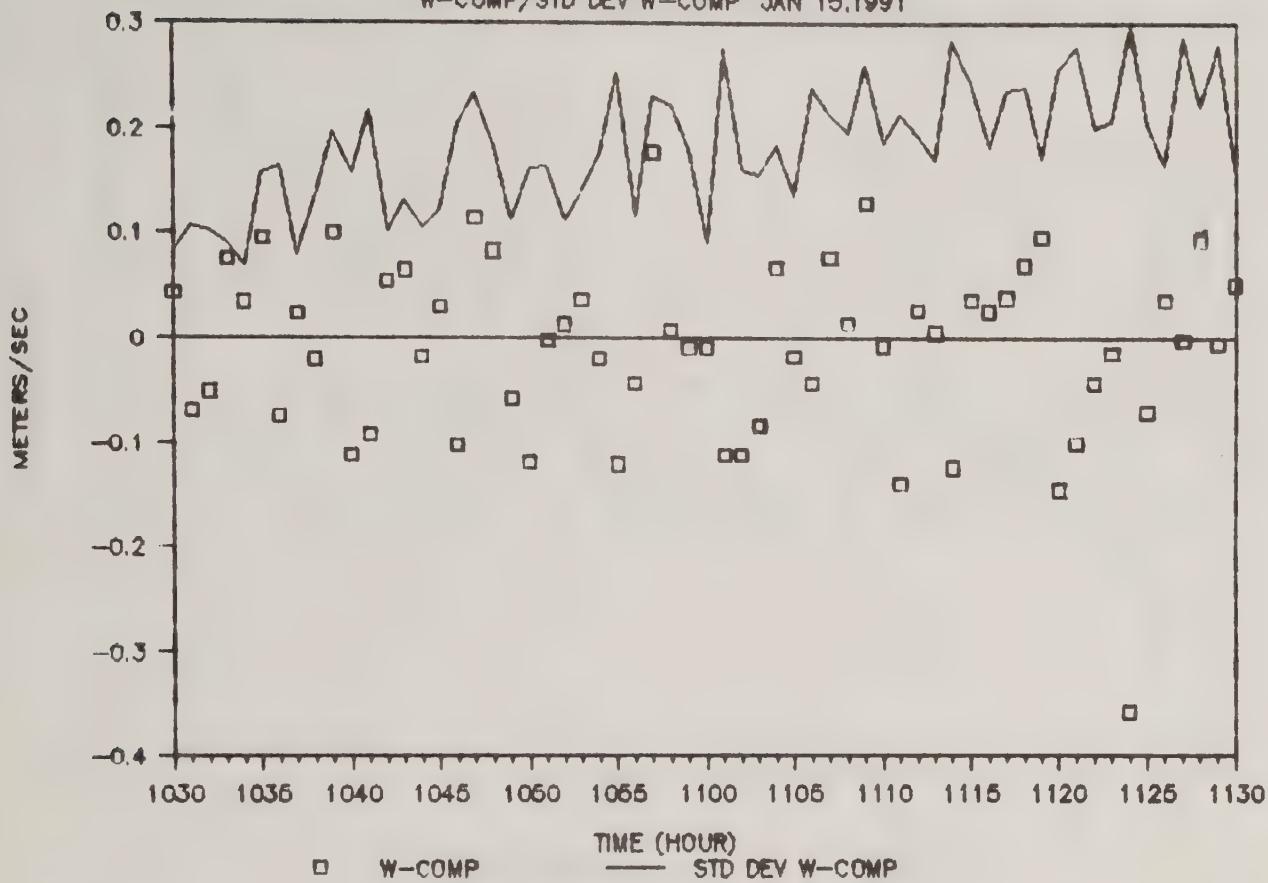
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



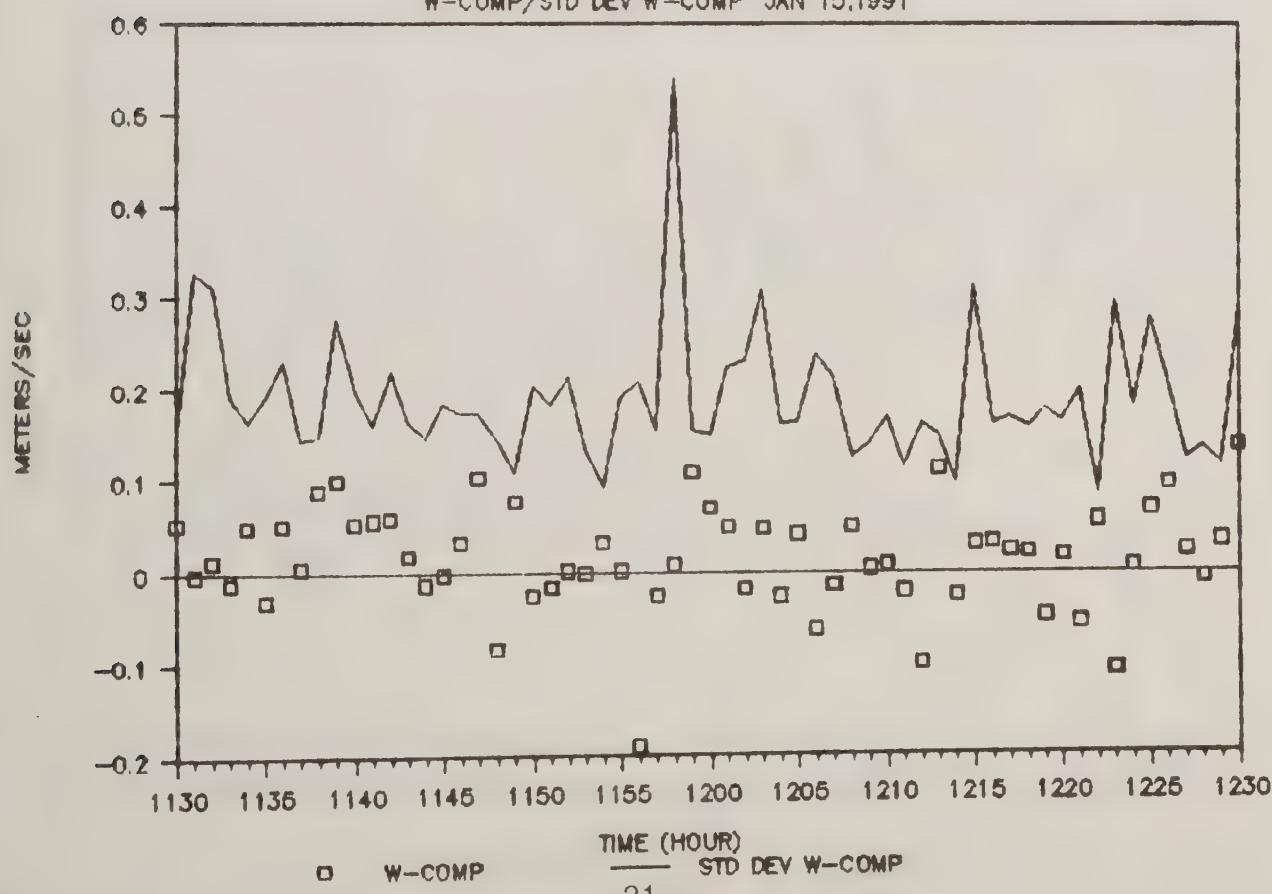
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



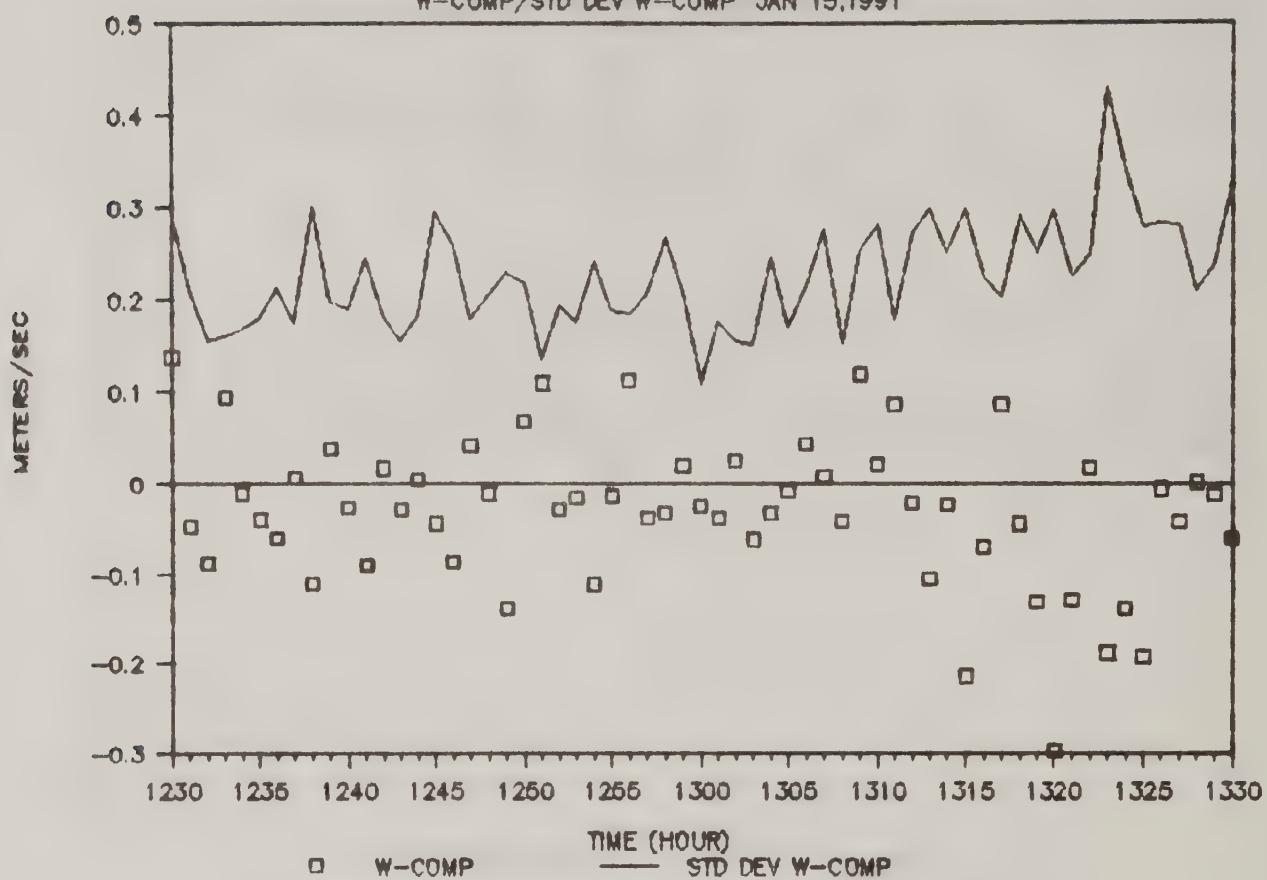
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



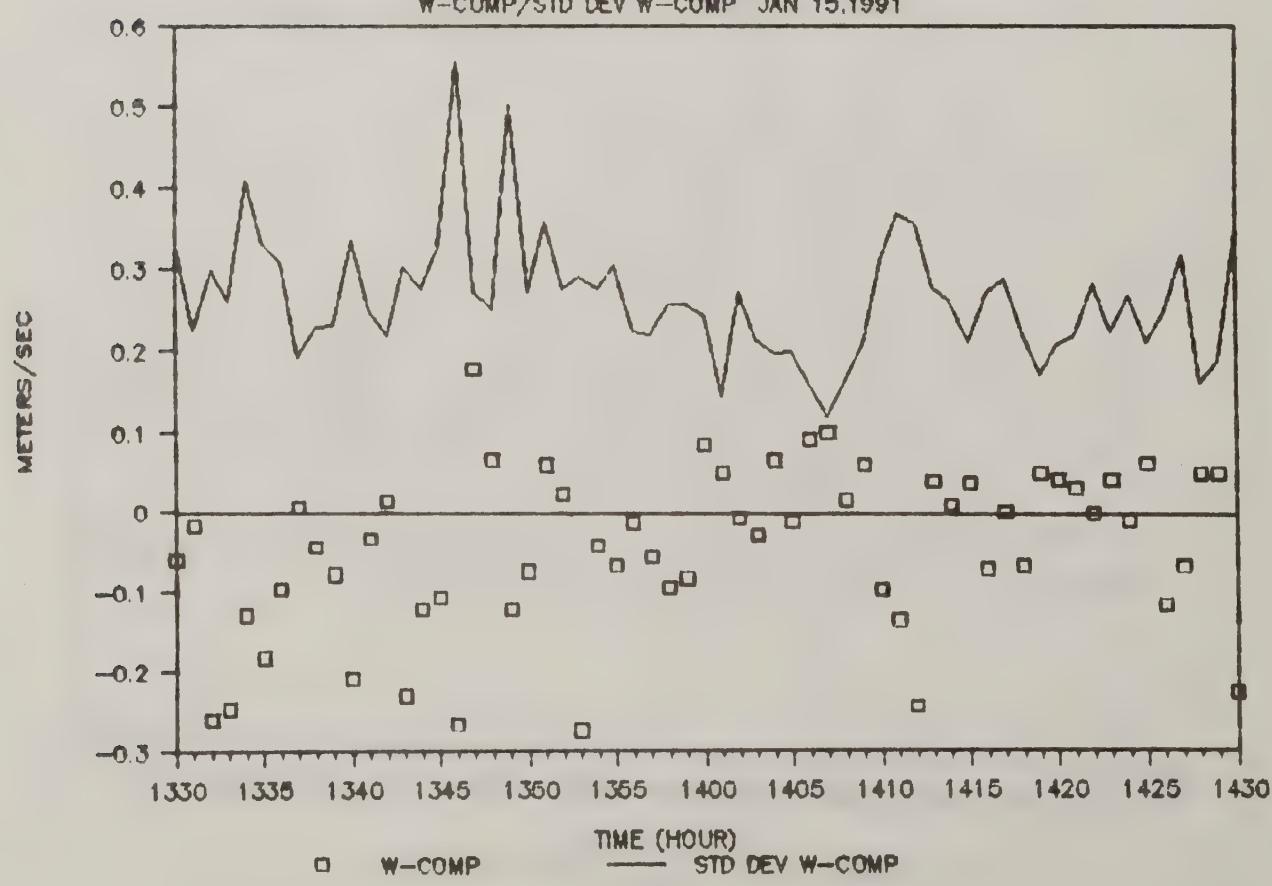
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



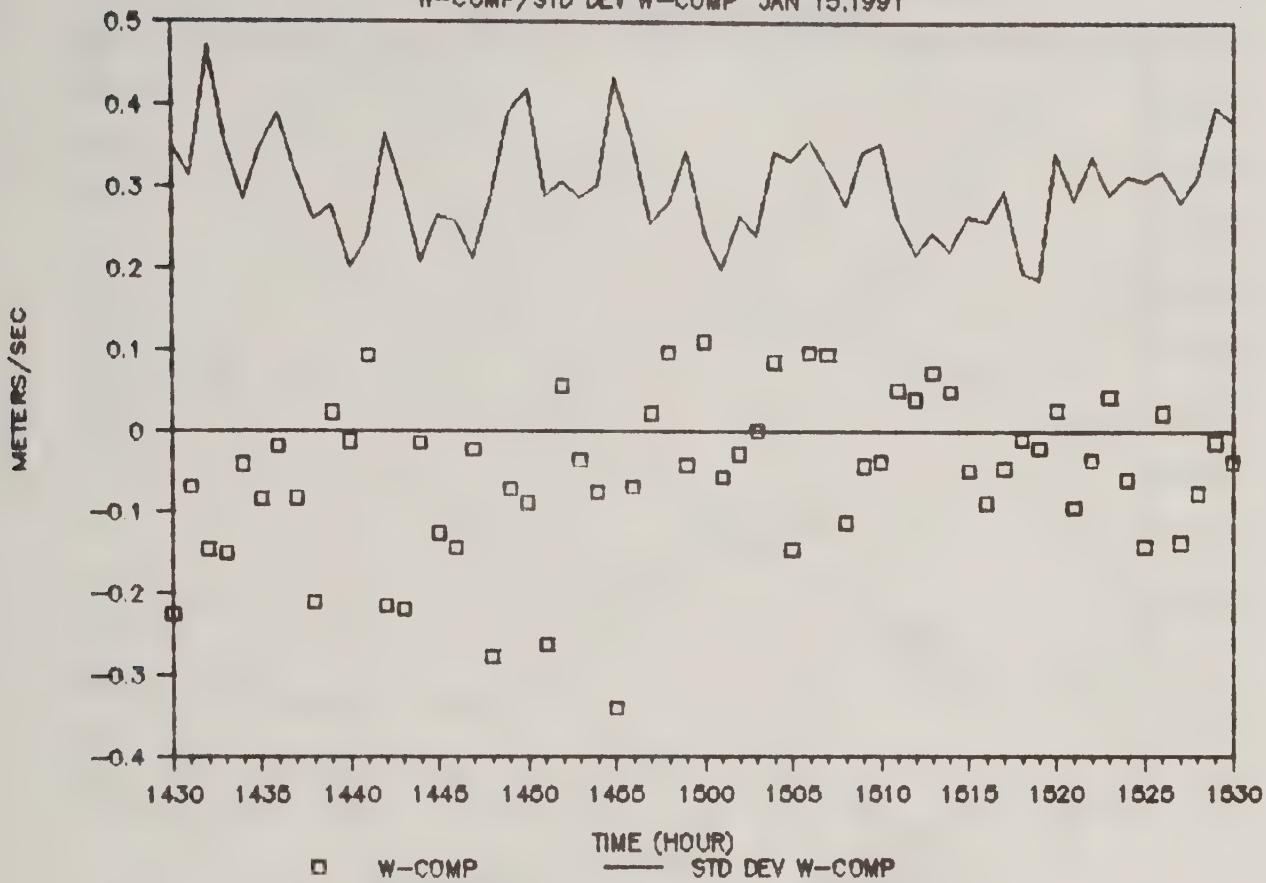
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



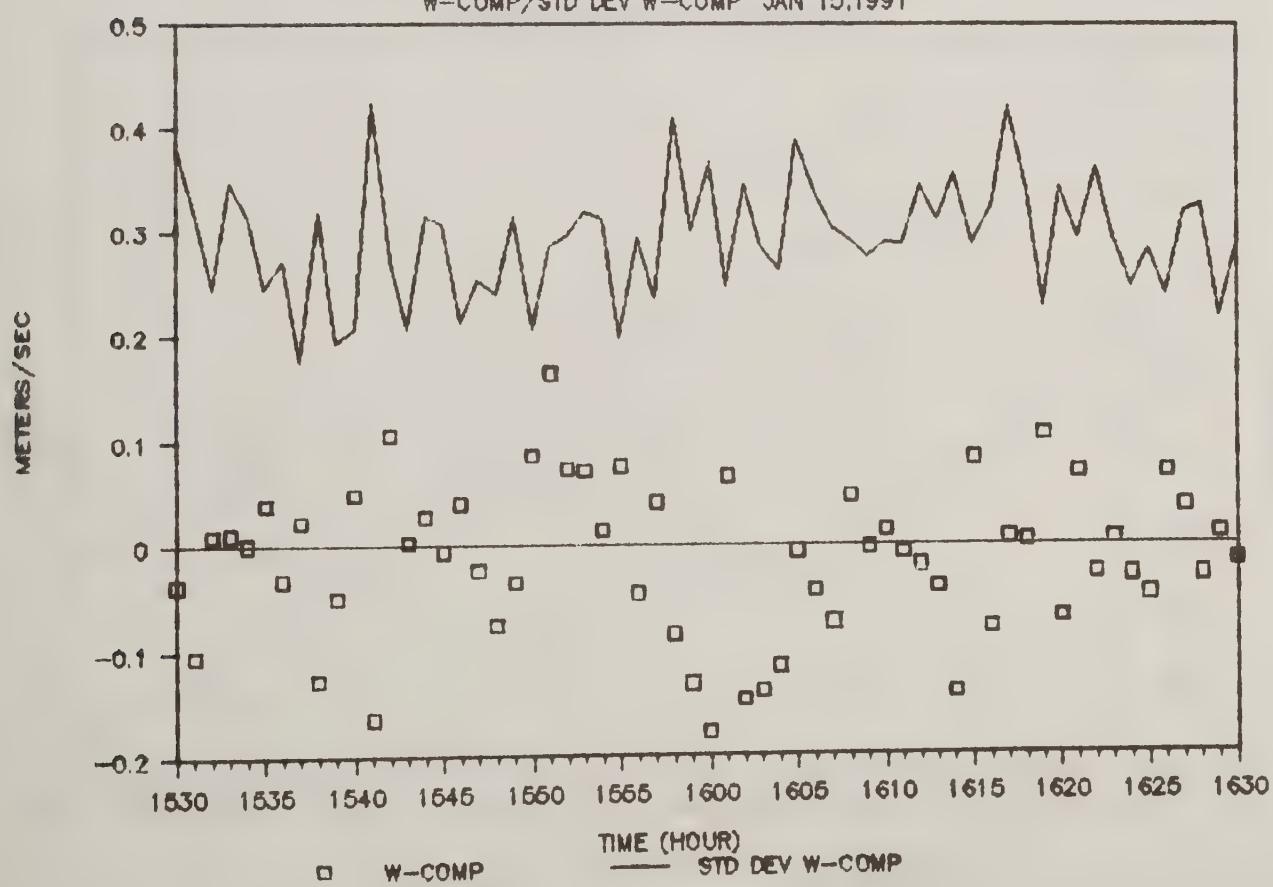
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



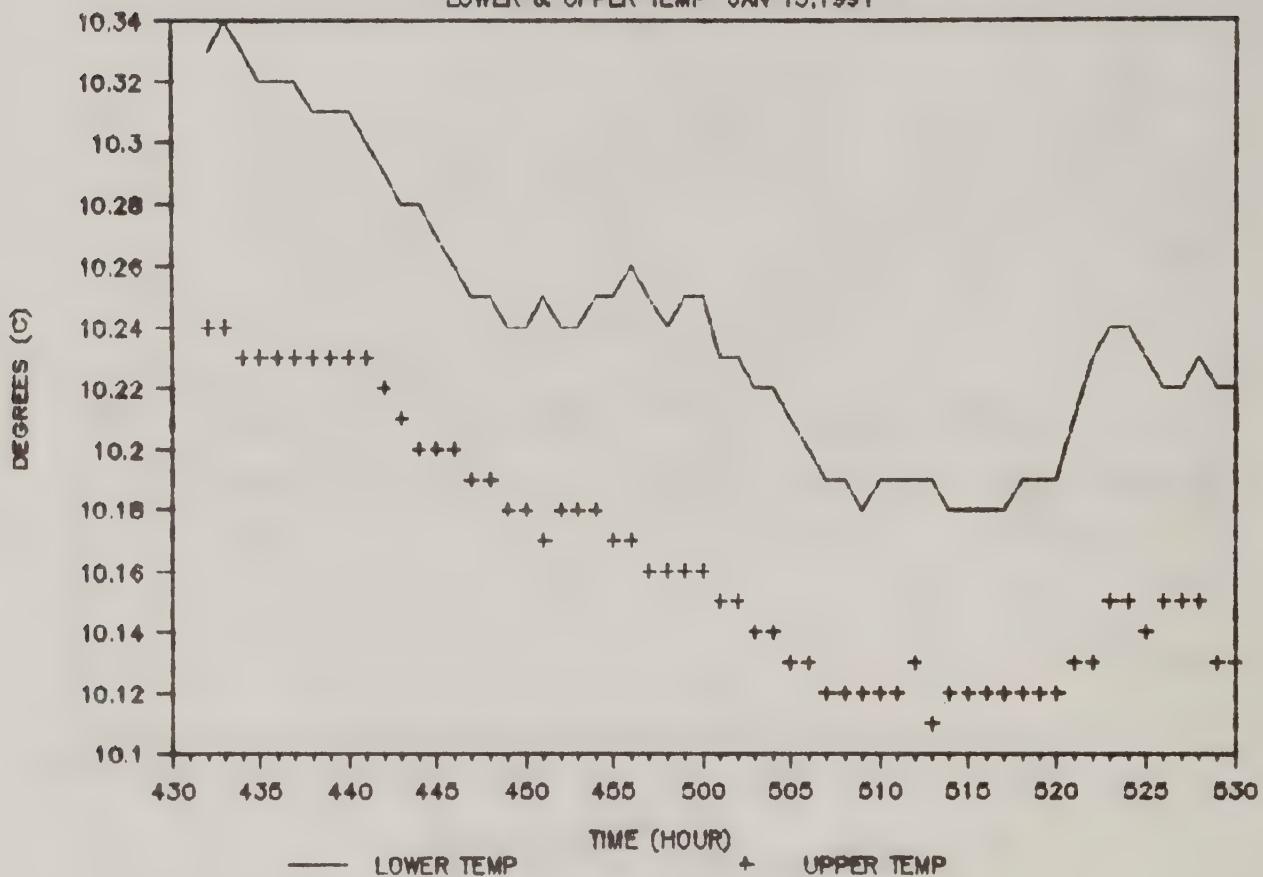
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 15,1991



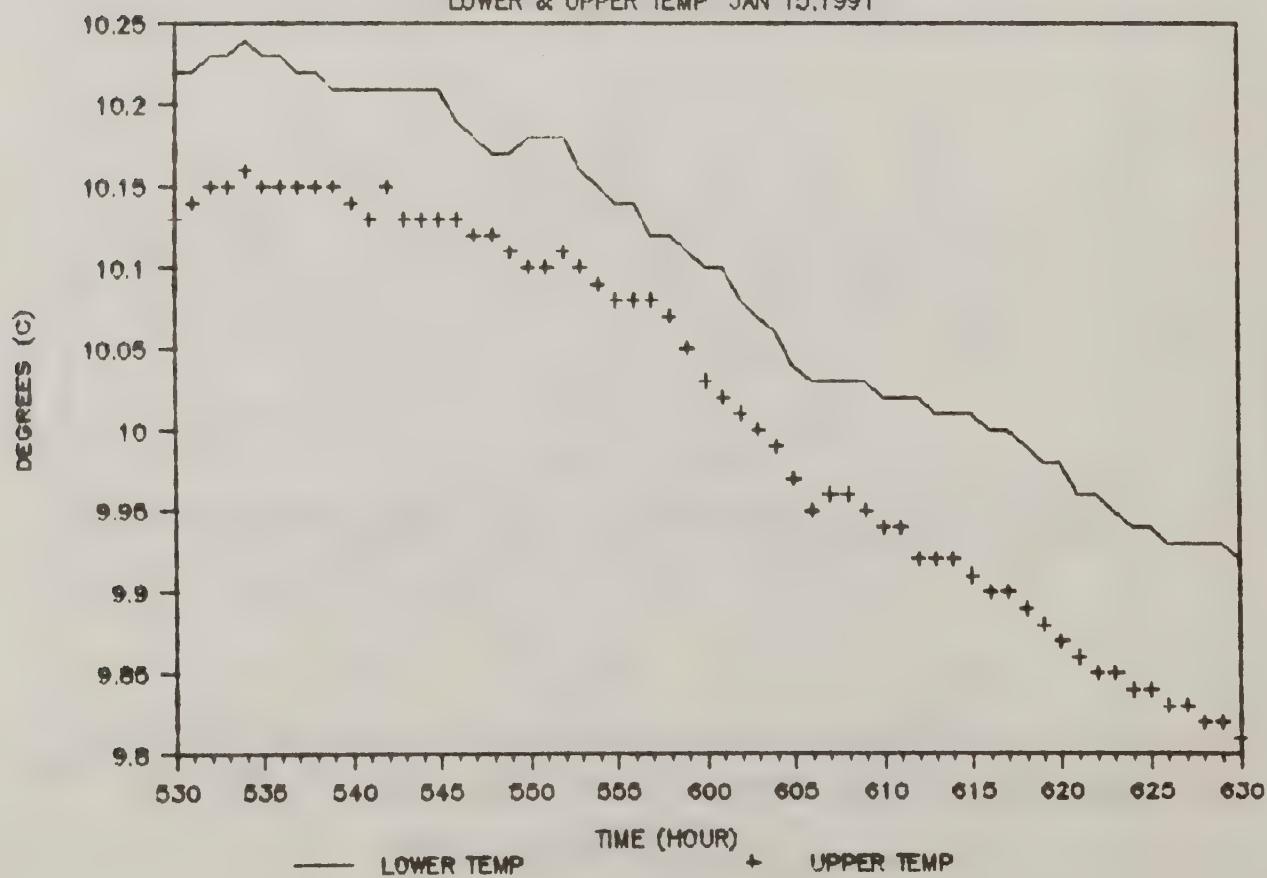
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15, 1991



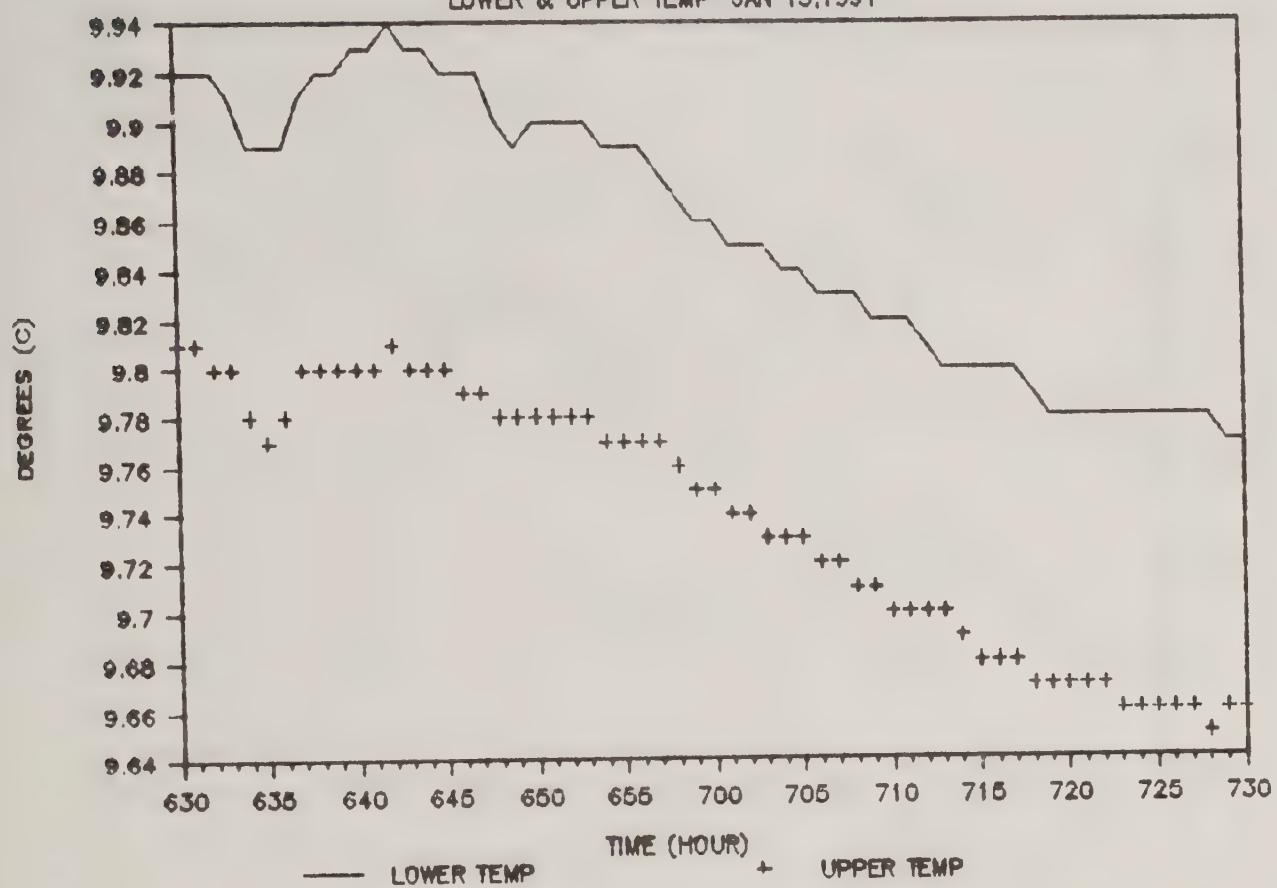
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15, 1991



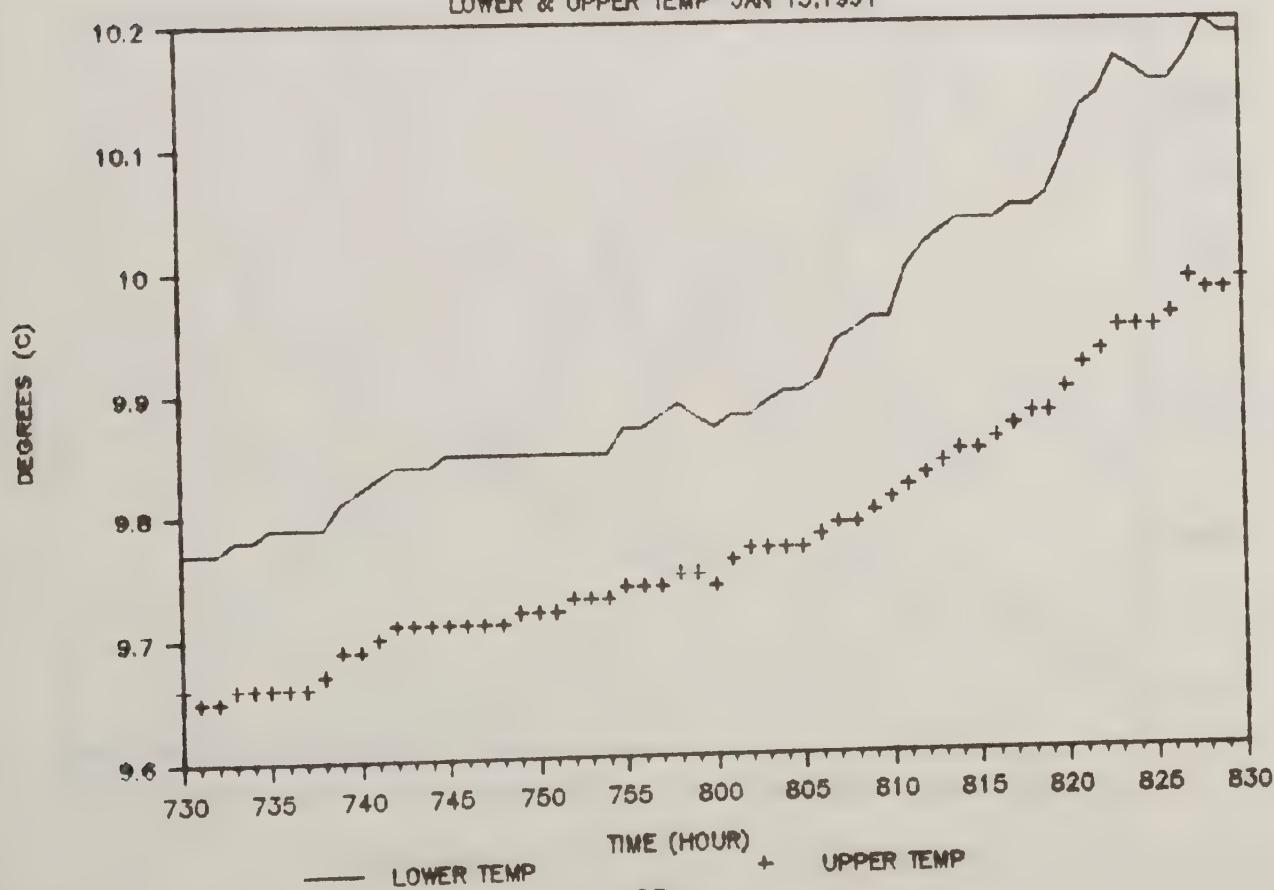
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15,1991



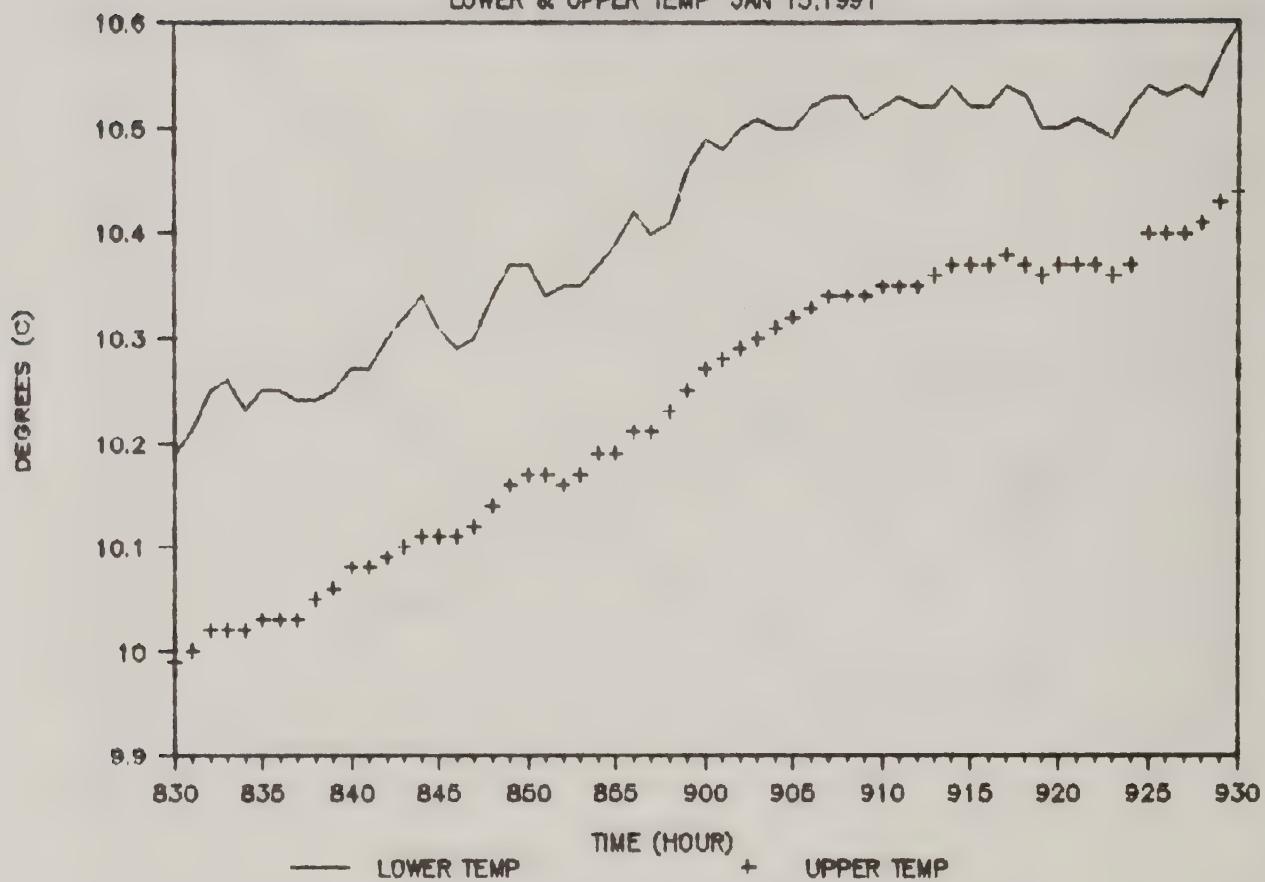
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15,1991



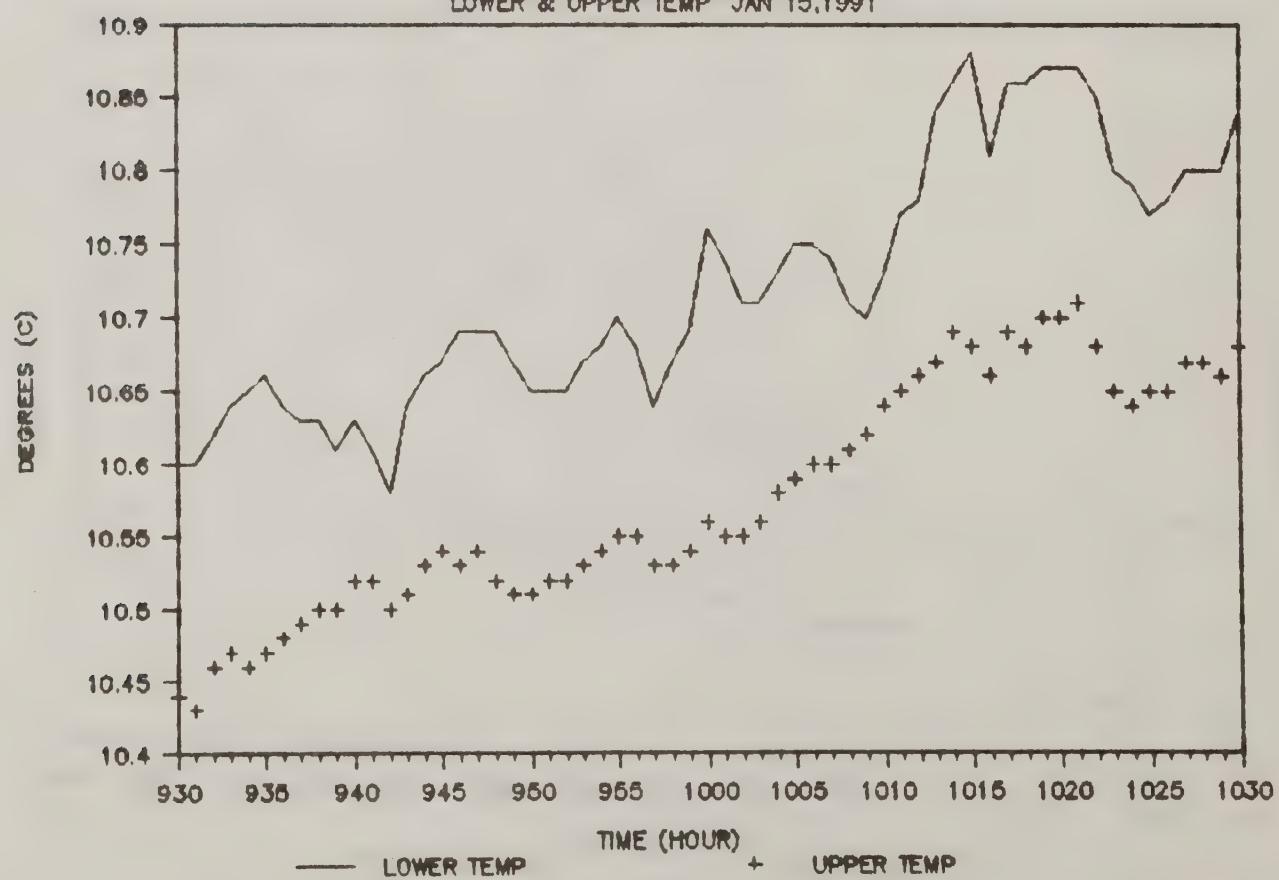
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15, 1991



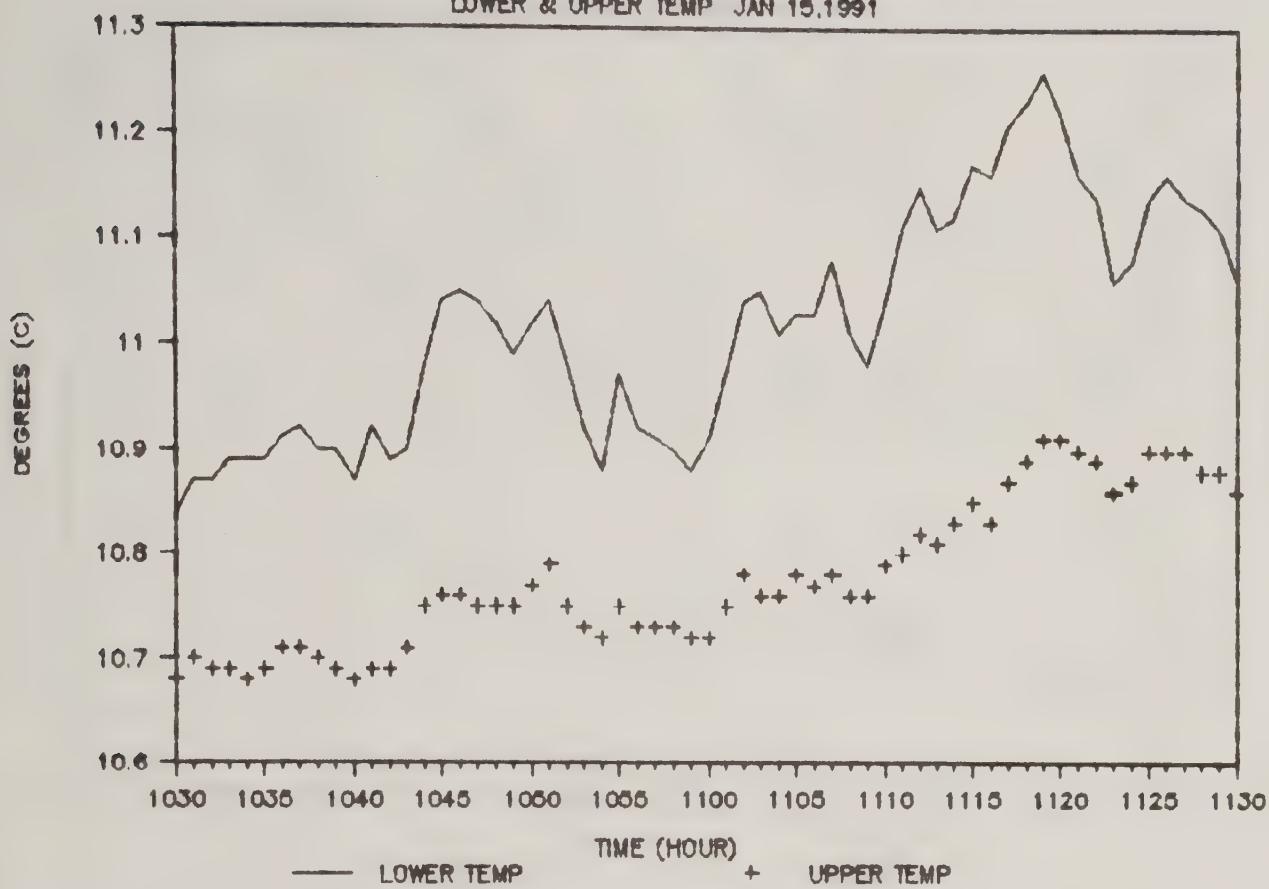
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15, 1991



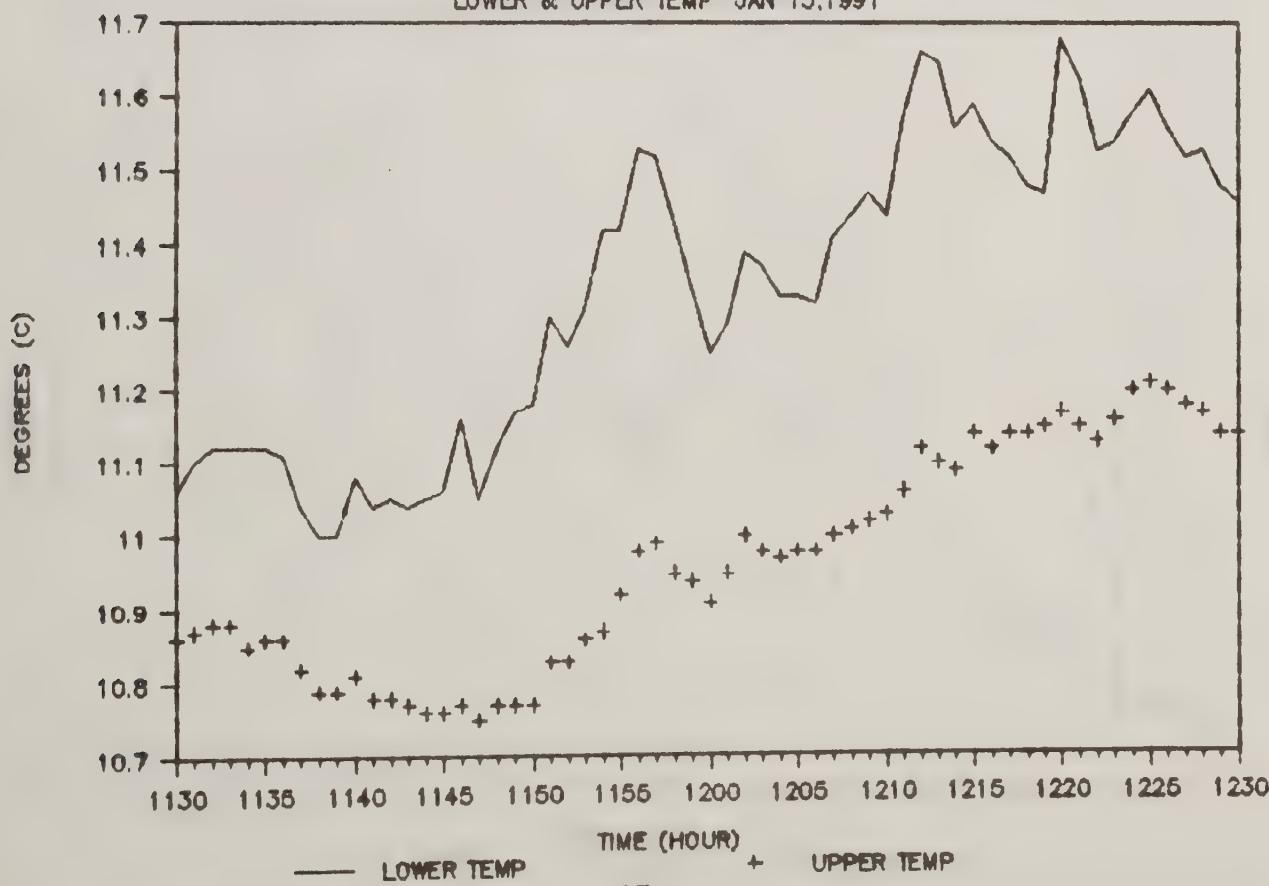
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15, 1991



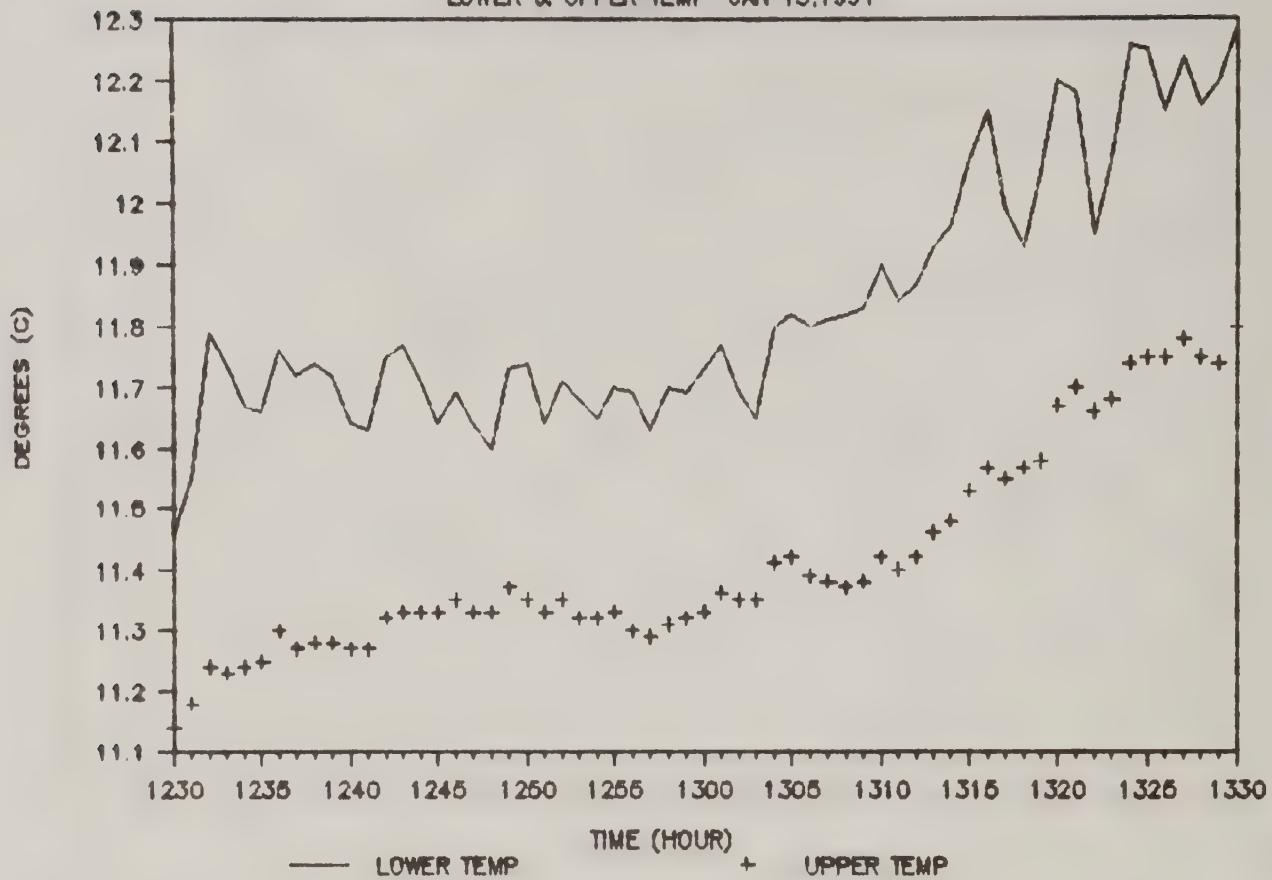
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15, 1991



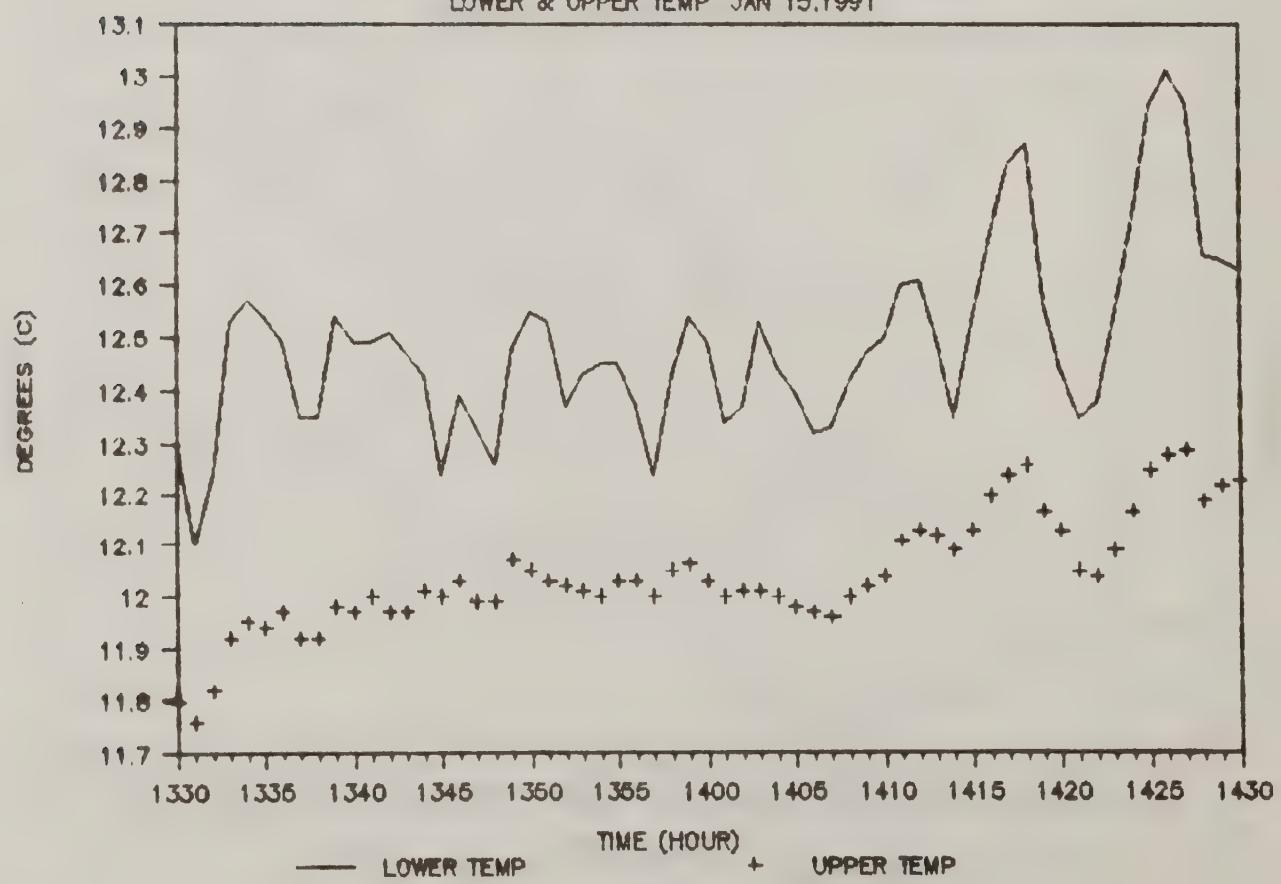
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15,1991



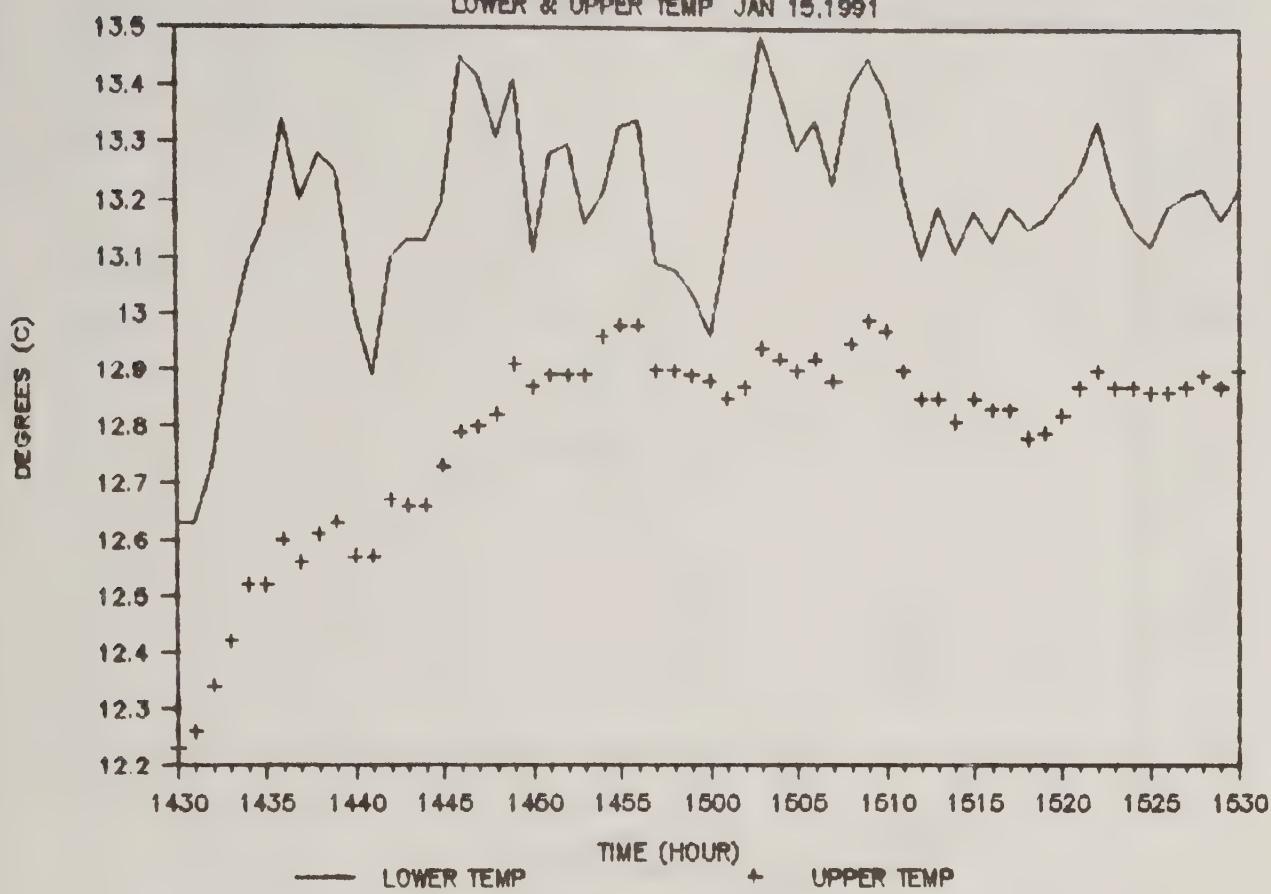
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15,1991



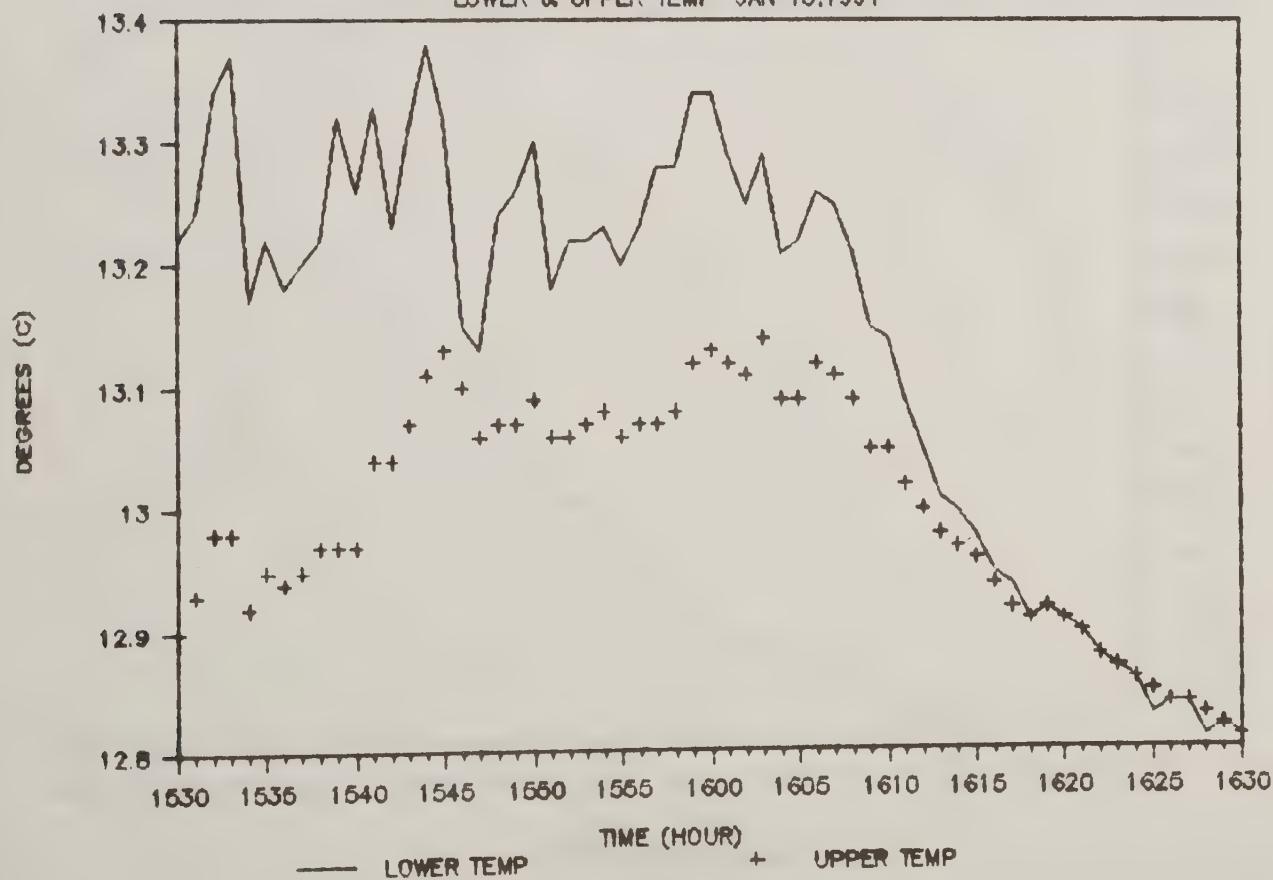
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15.1991



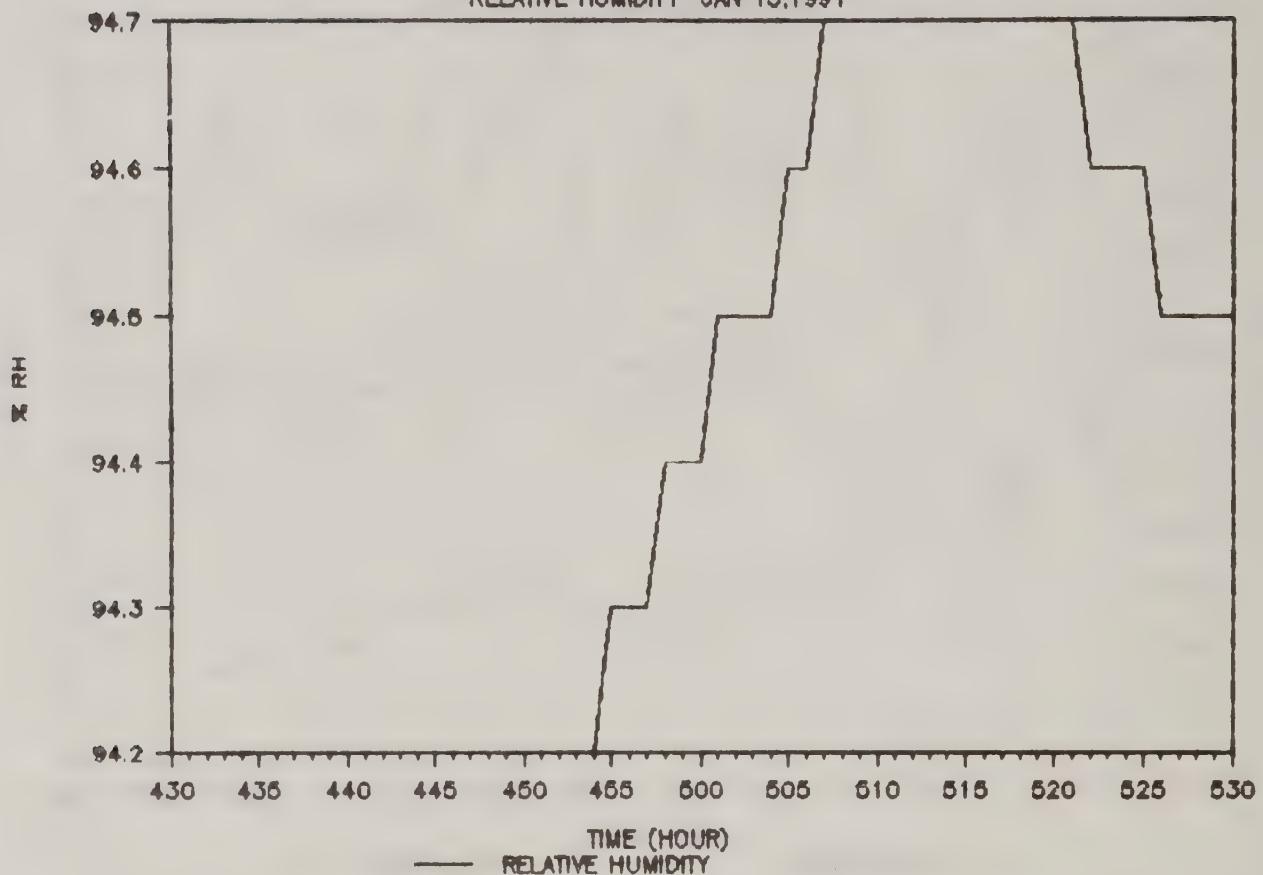
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 15.1991



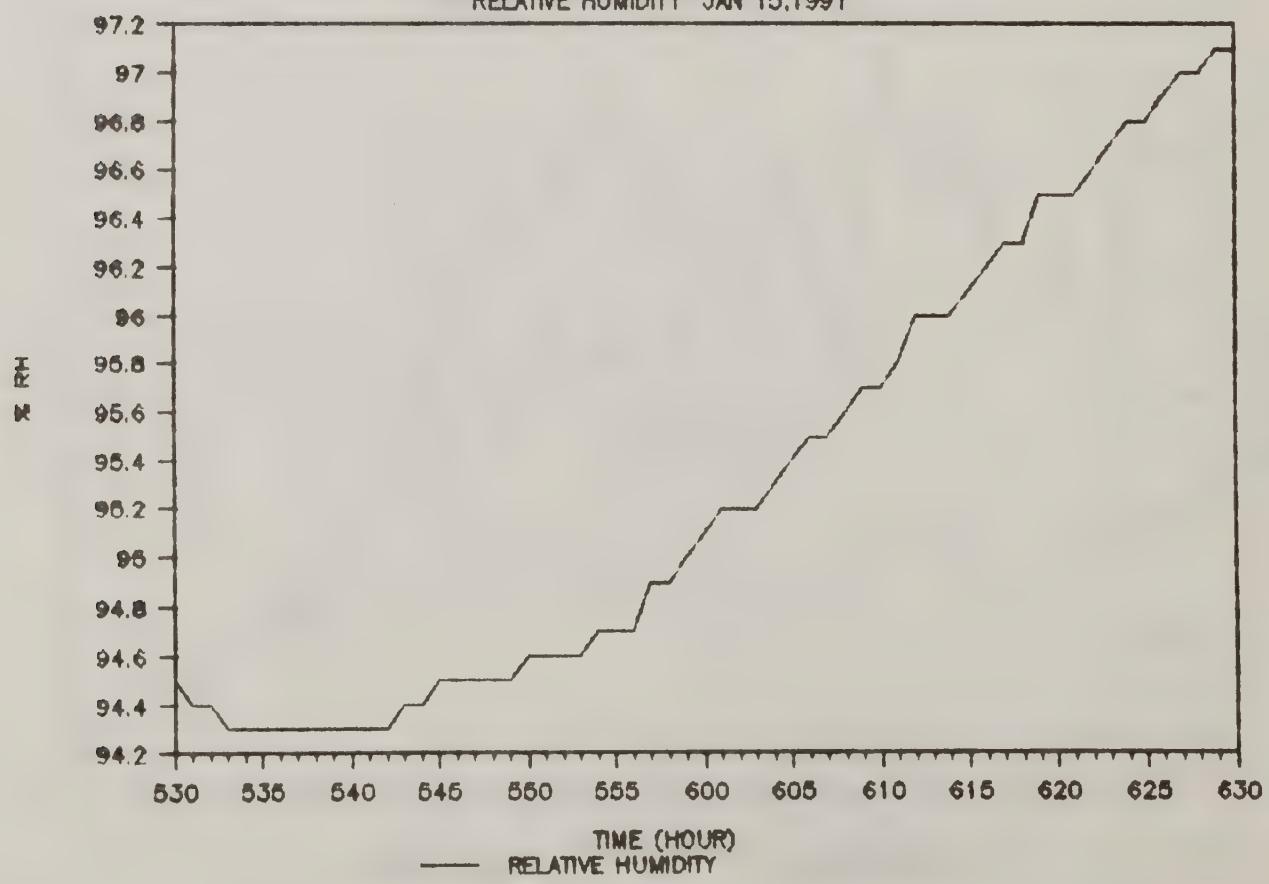
DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 15,1991



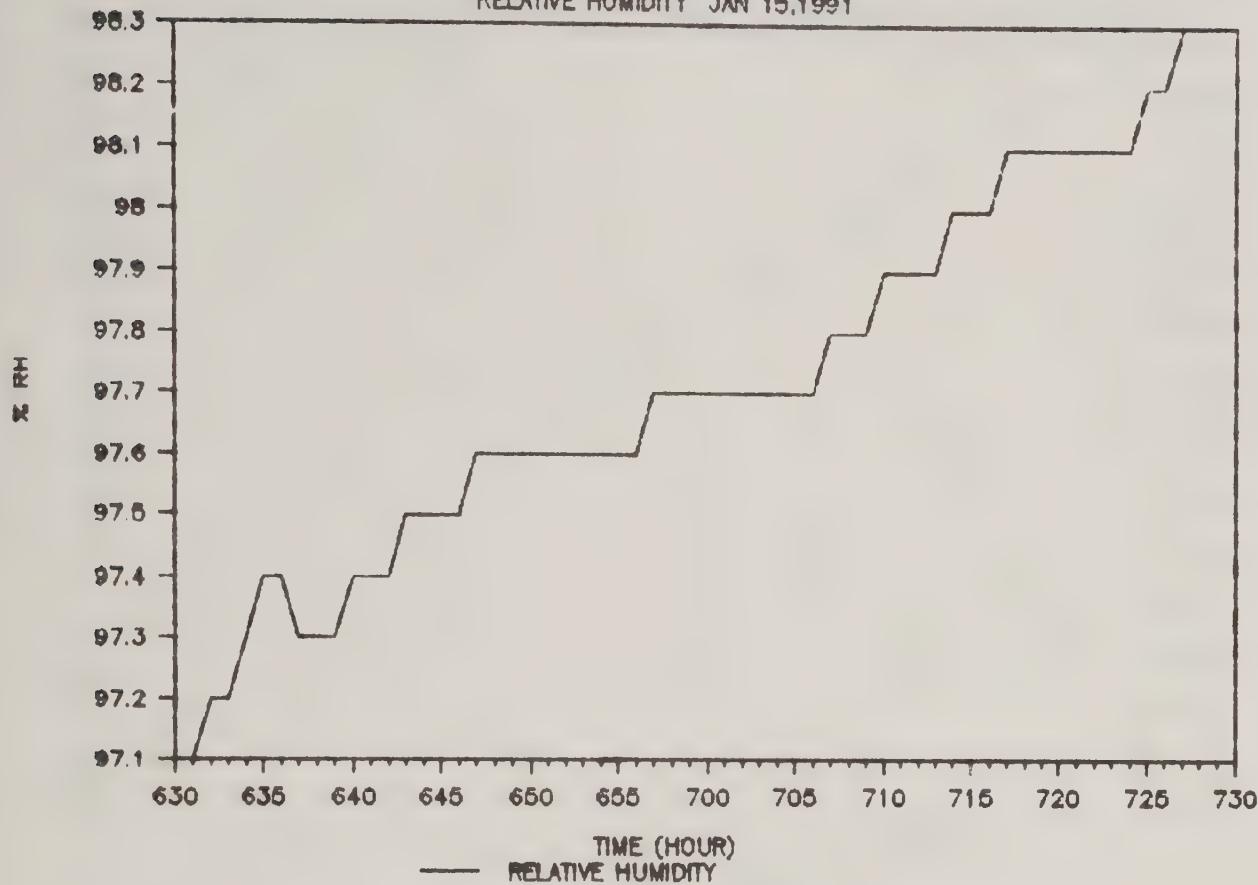
DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 15,1991



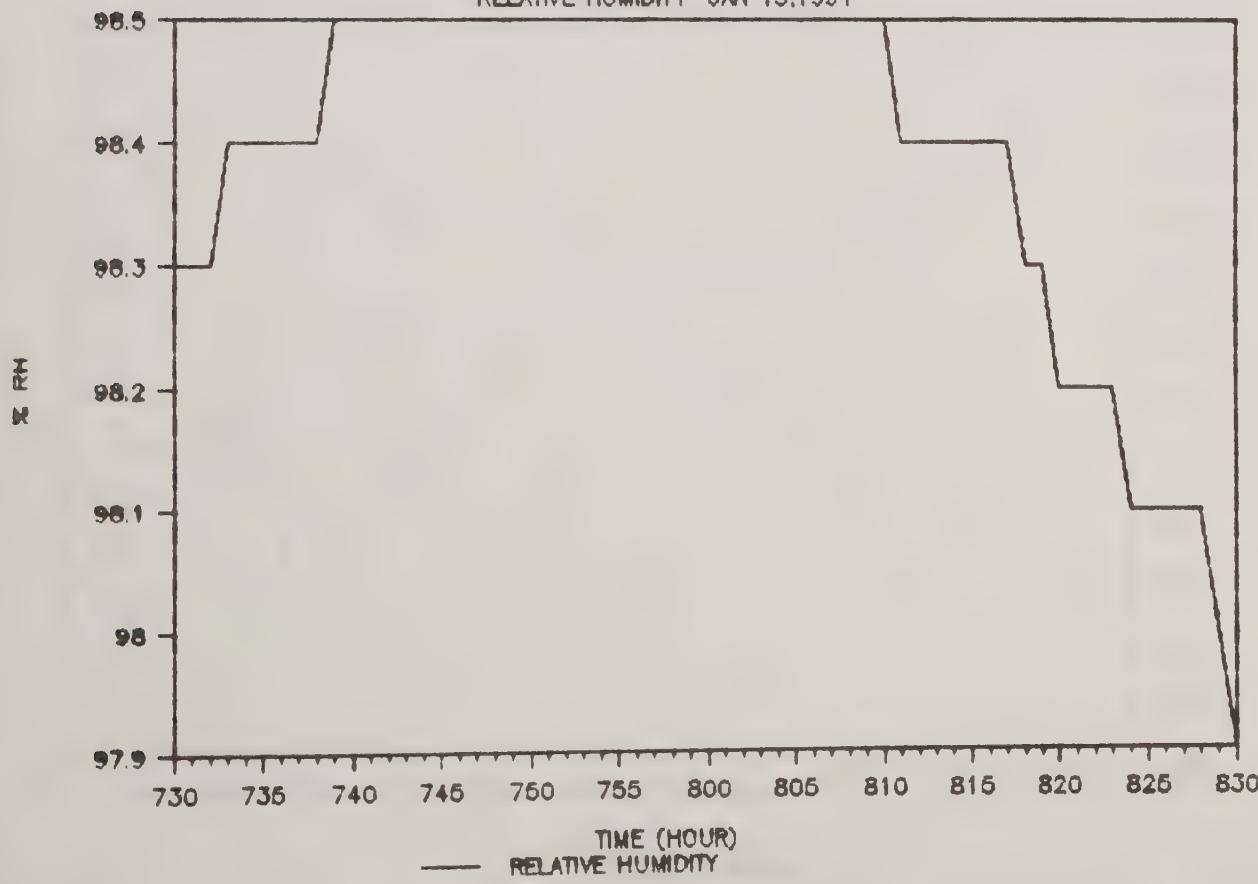
DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 15,1991



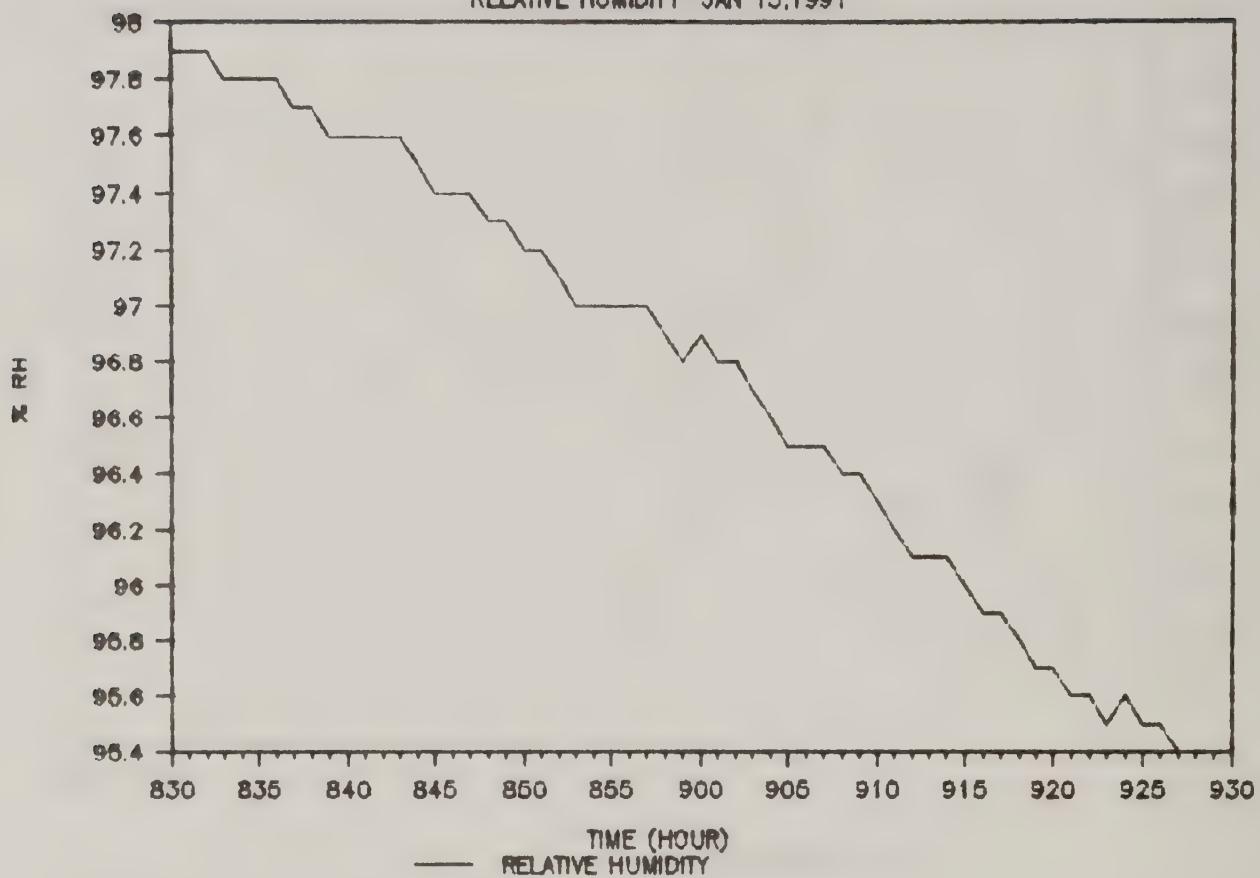
DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 15,1991



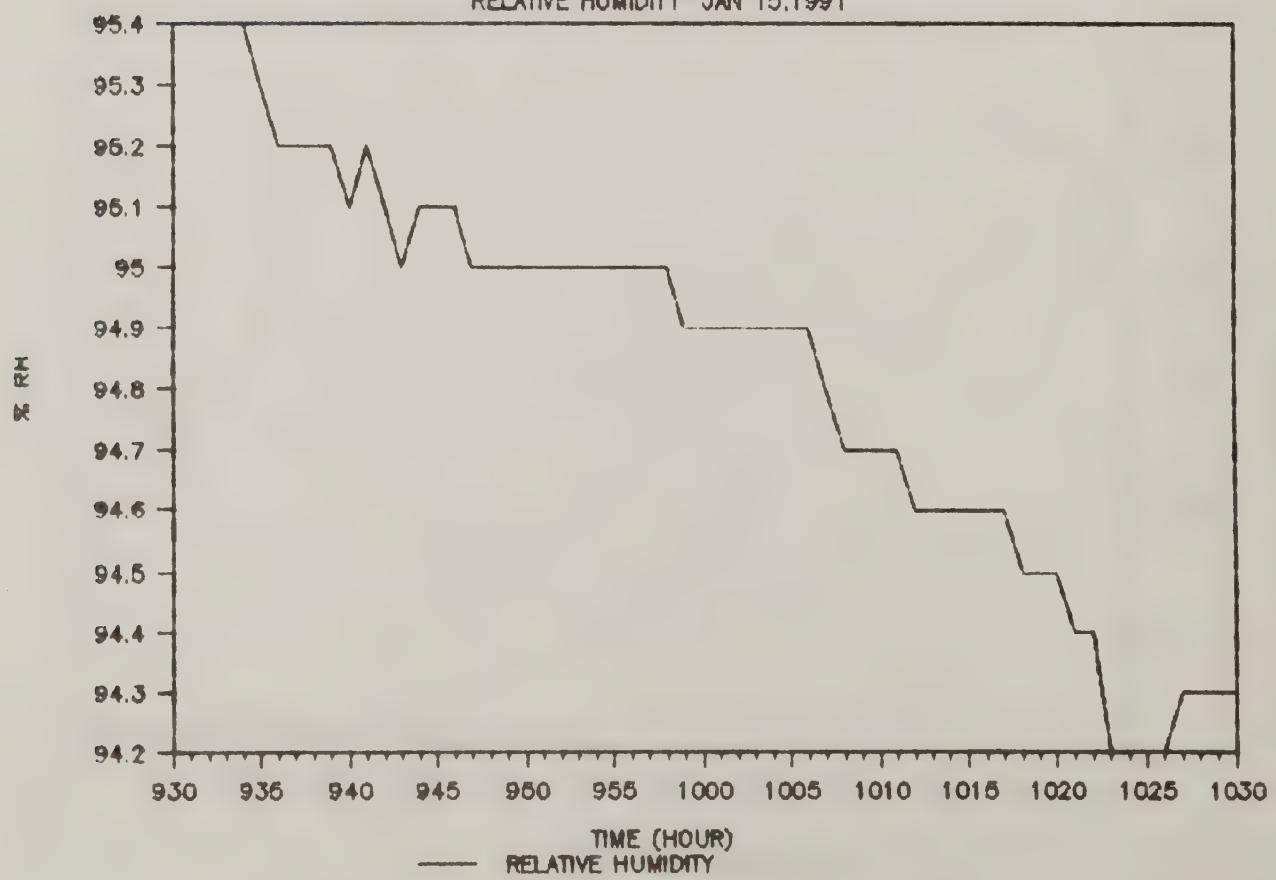
DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 15,1991



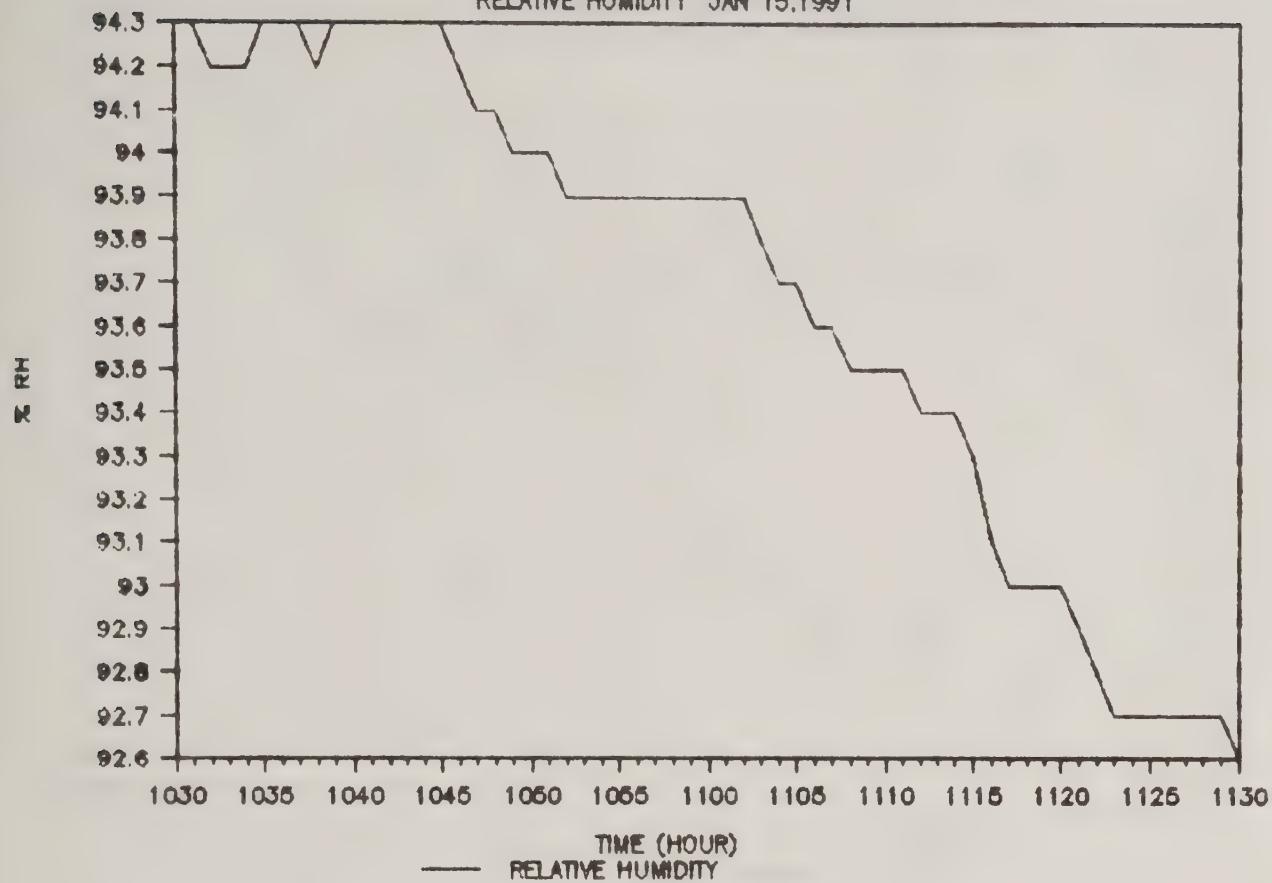
DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 15,1991



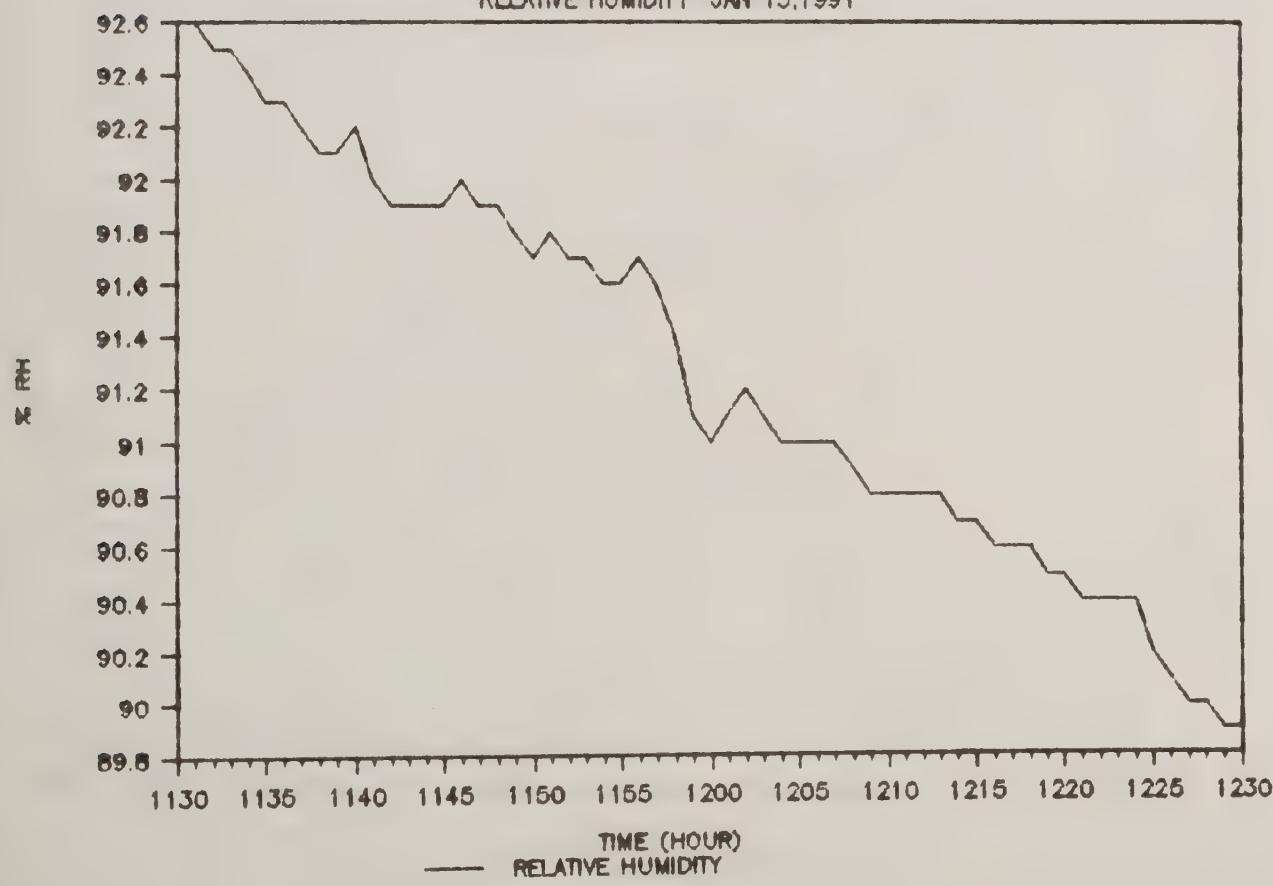
DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 15,1991

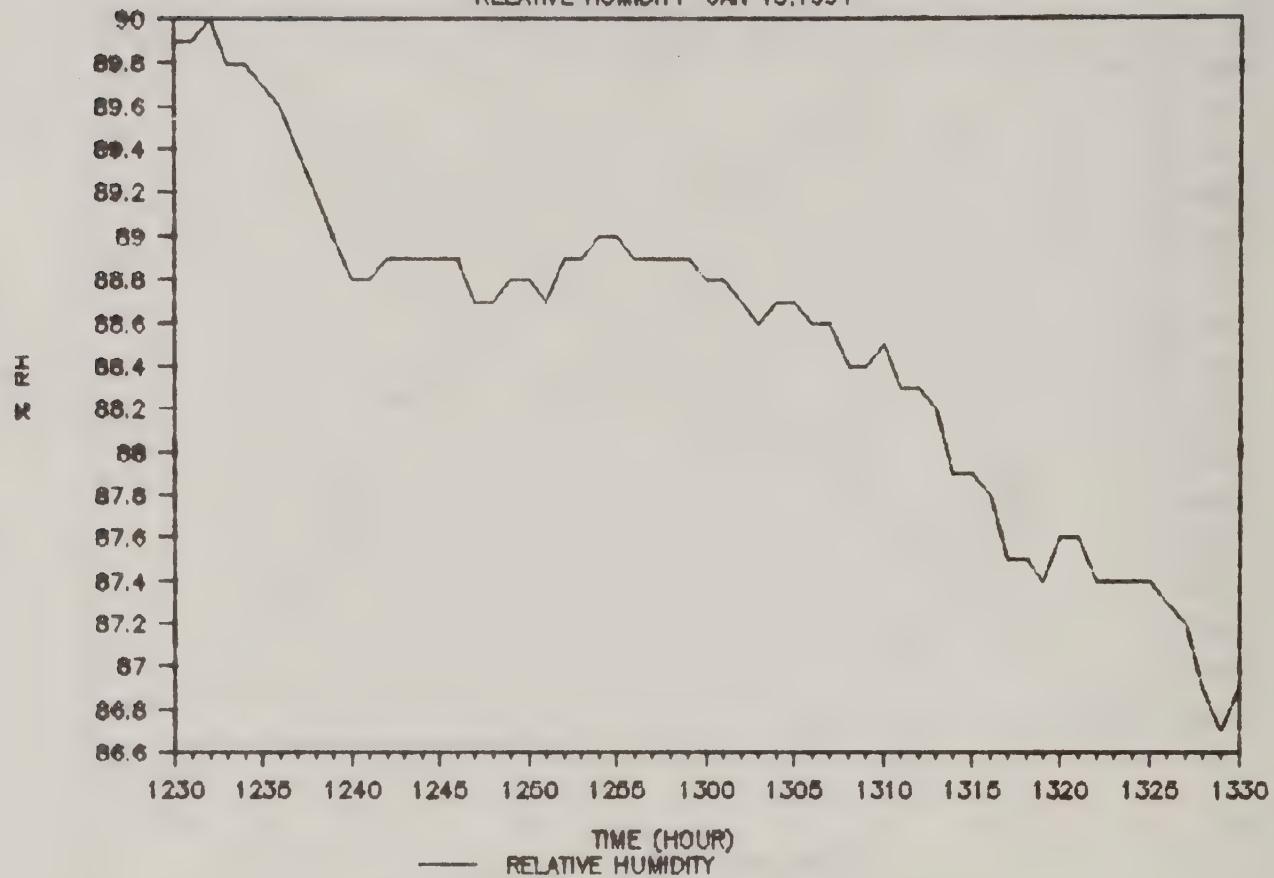


DAVIS WEATHER DATA STN #1

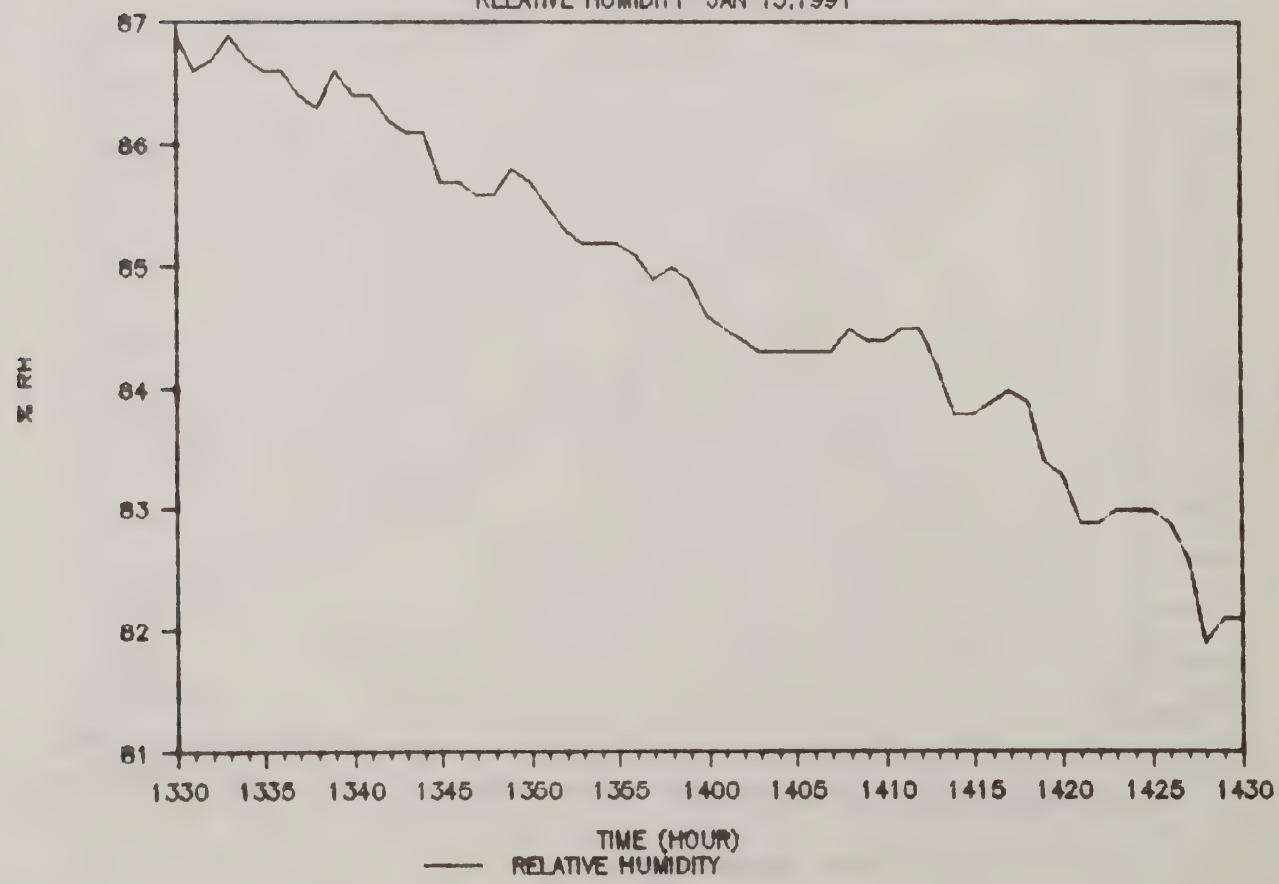
RELATIVE HUMIDITY JAN 15,1991



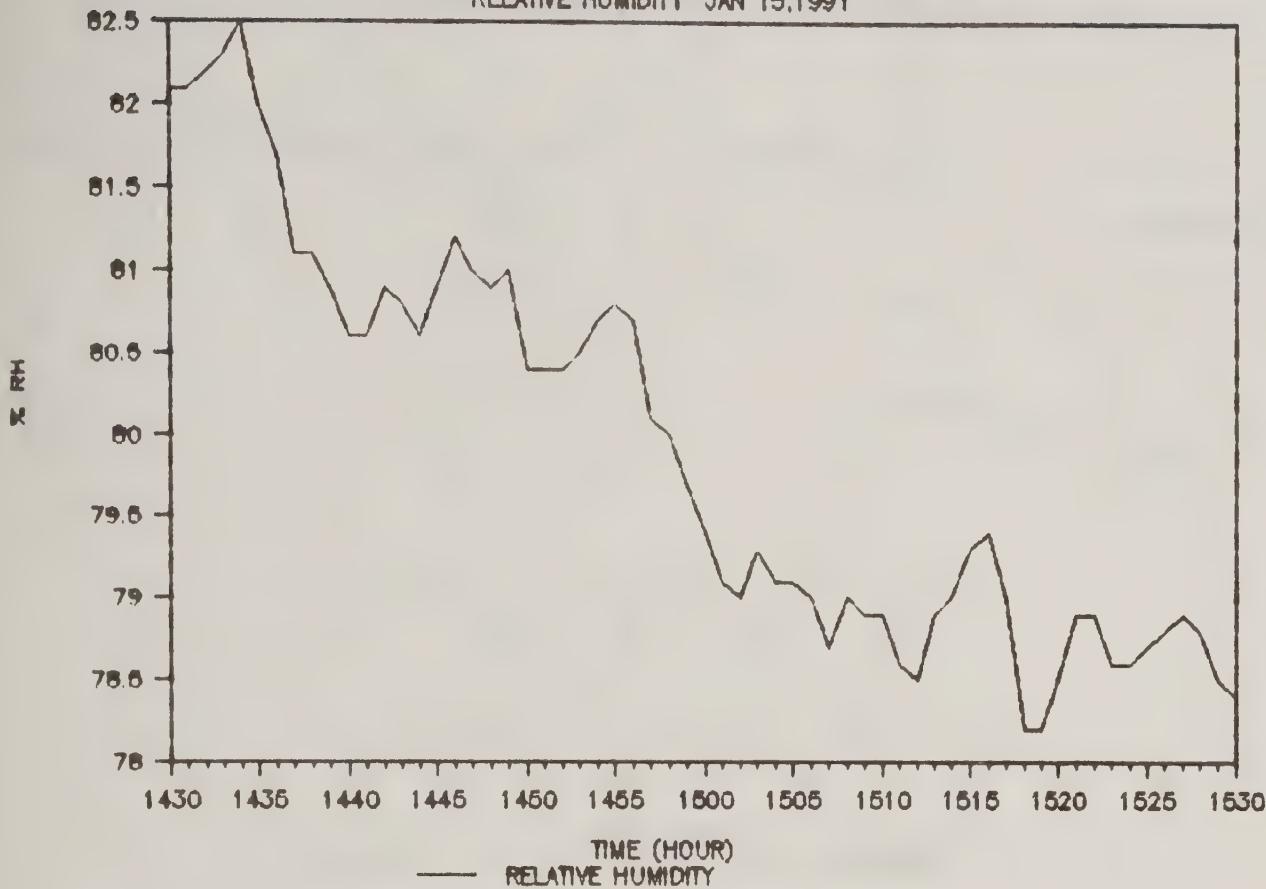
DAVIS WEATHER DATA STN #1
RELATIVE HUMIDITY JAN 15.1991



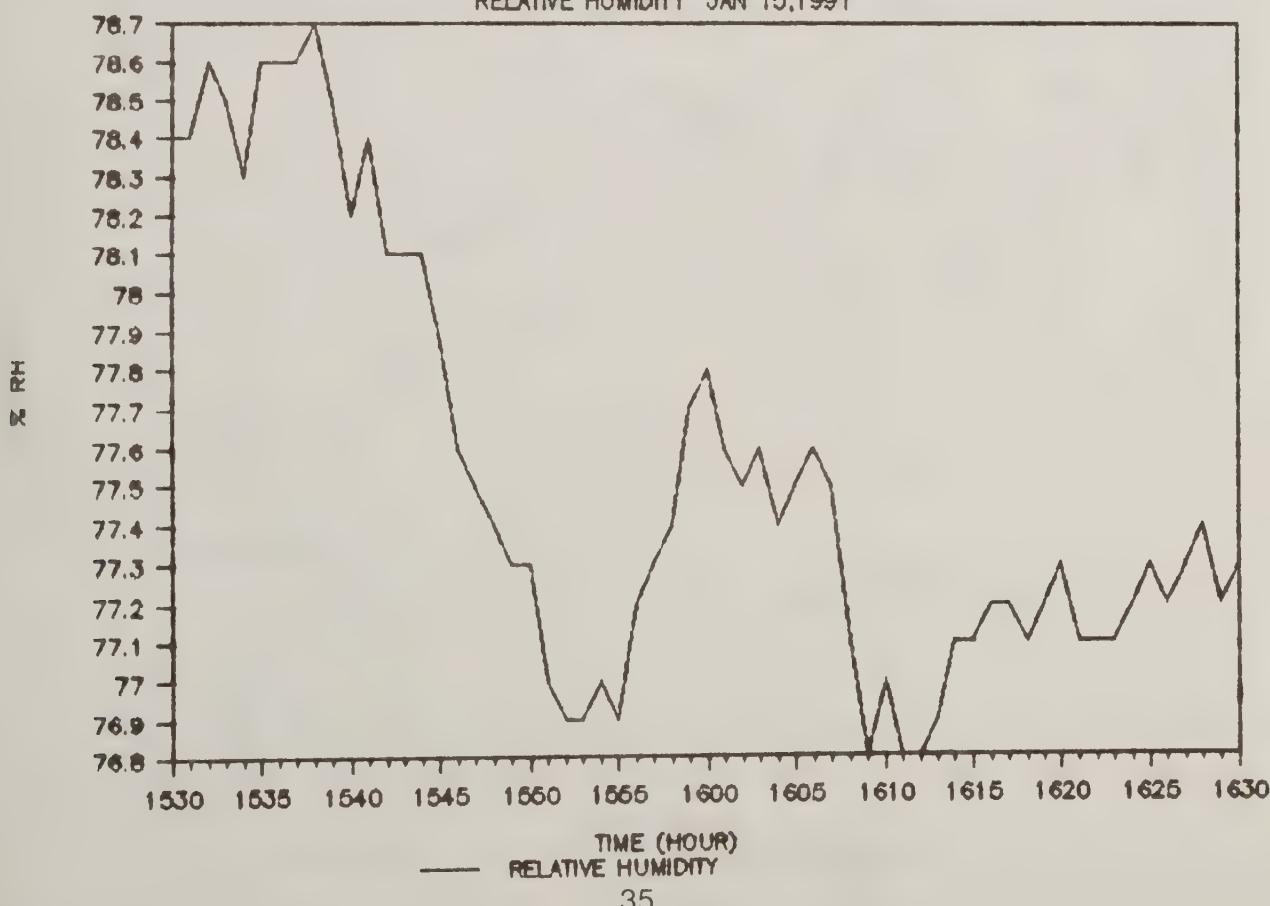
DAVIS WEATHER DATA STN #1
RELATIVE HUMIDITY JAN 15.1991



DAVIS WEATHER DATA STN #1
RELATIVE HUMIDITY JAN 15,1991



DAVIS WEATHER DATA STN #1
RELATIVE HUMIDITY JAN 15,1991

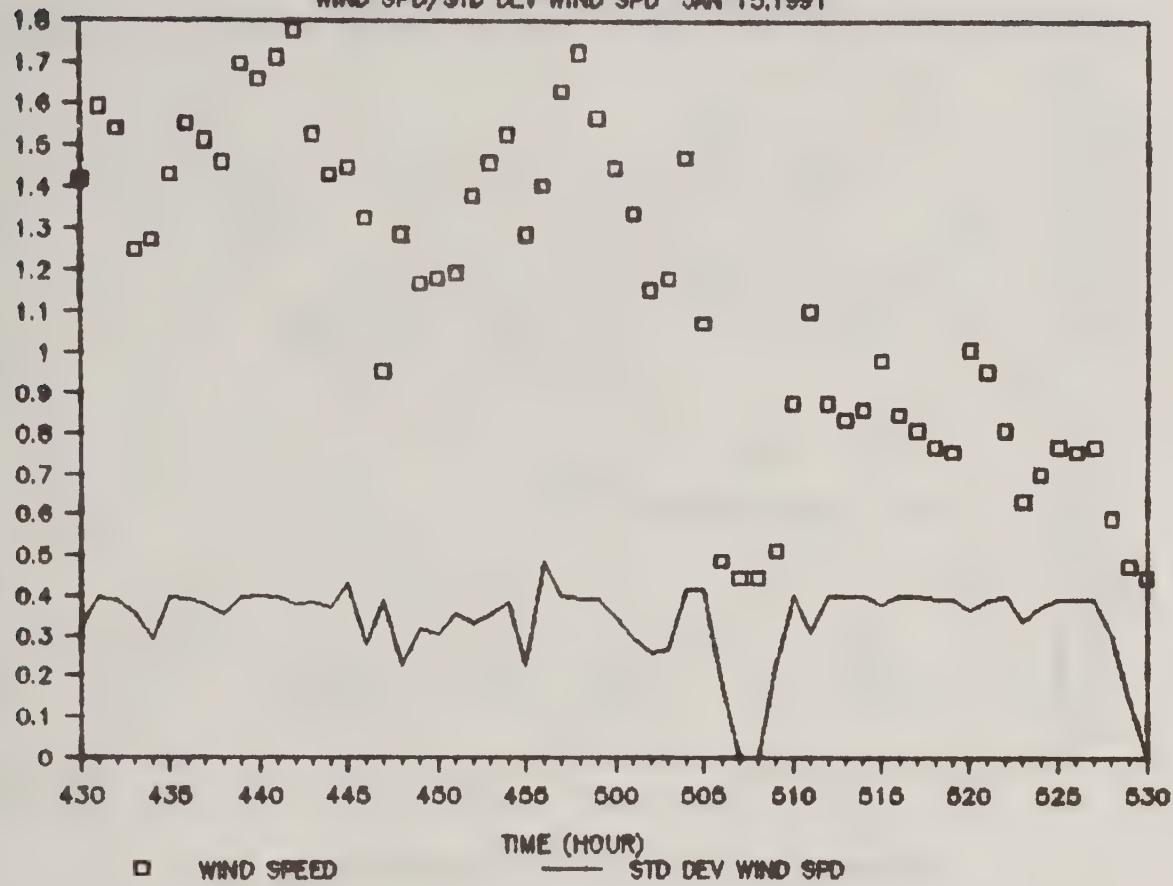


Davis Weather Data Station No. 2
January 15, 1991

DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 15,1991

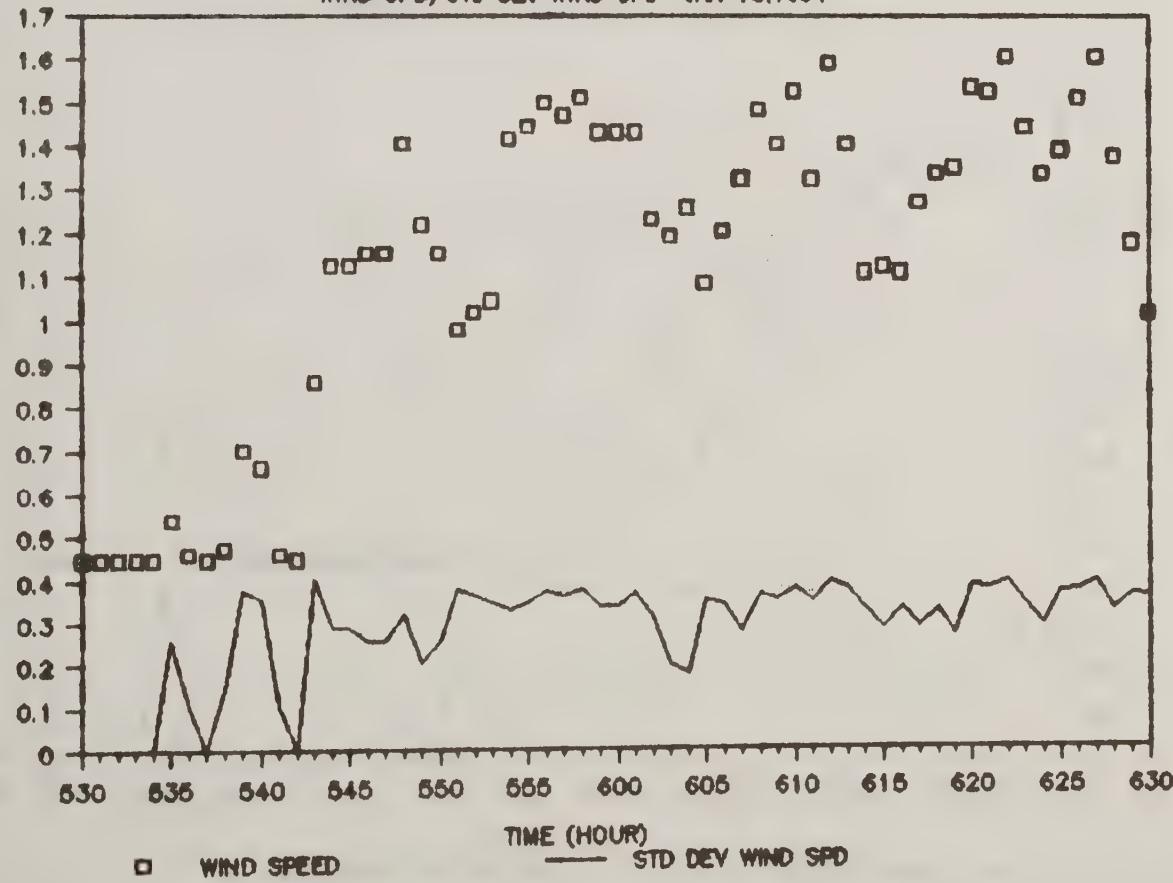
METERS/SEC



DAVIS WEATHER DATA STN #2

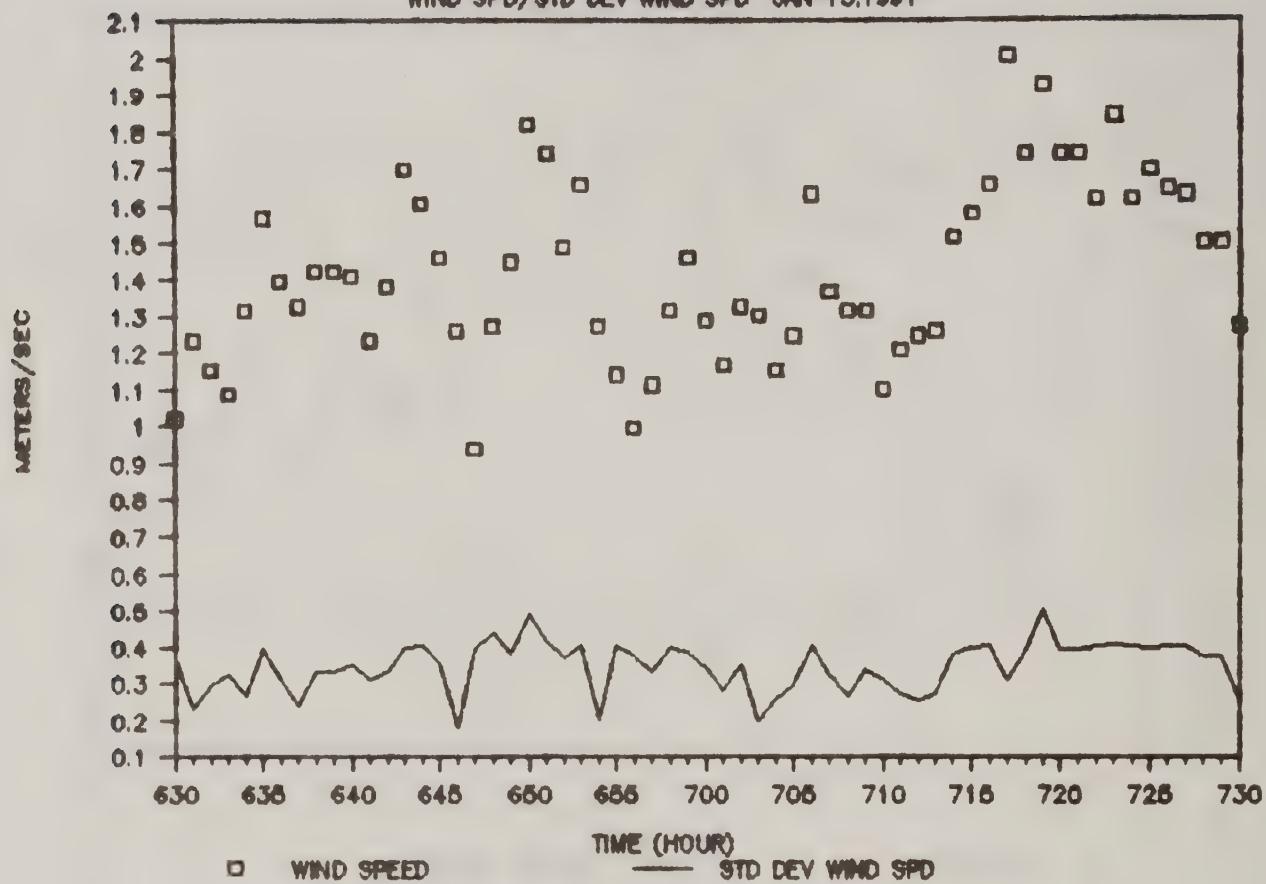
WIND SPD/STD DEV WIND SPD JAN 15,1991

METERS/SEC



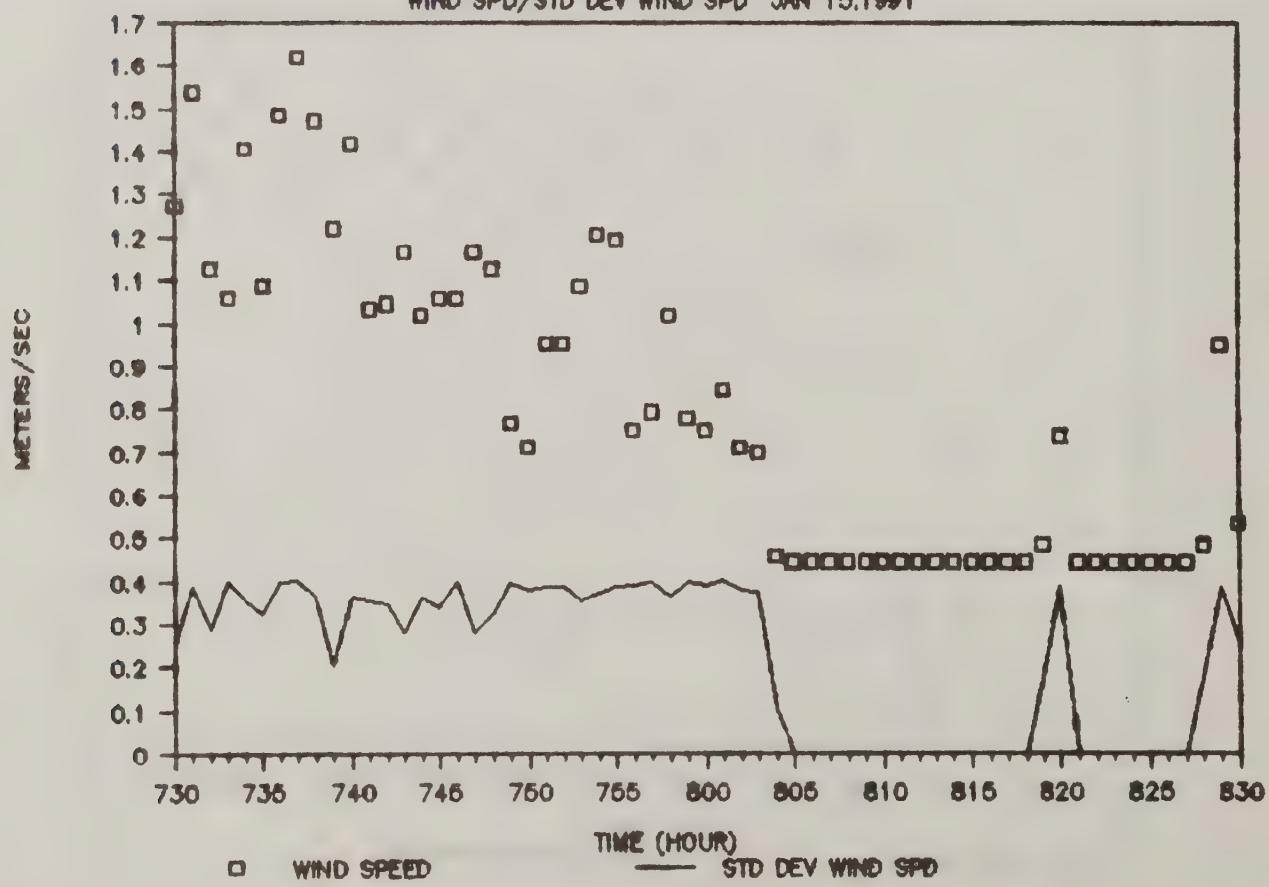
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 15, 1991



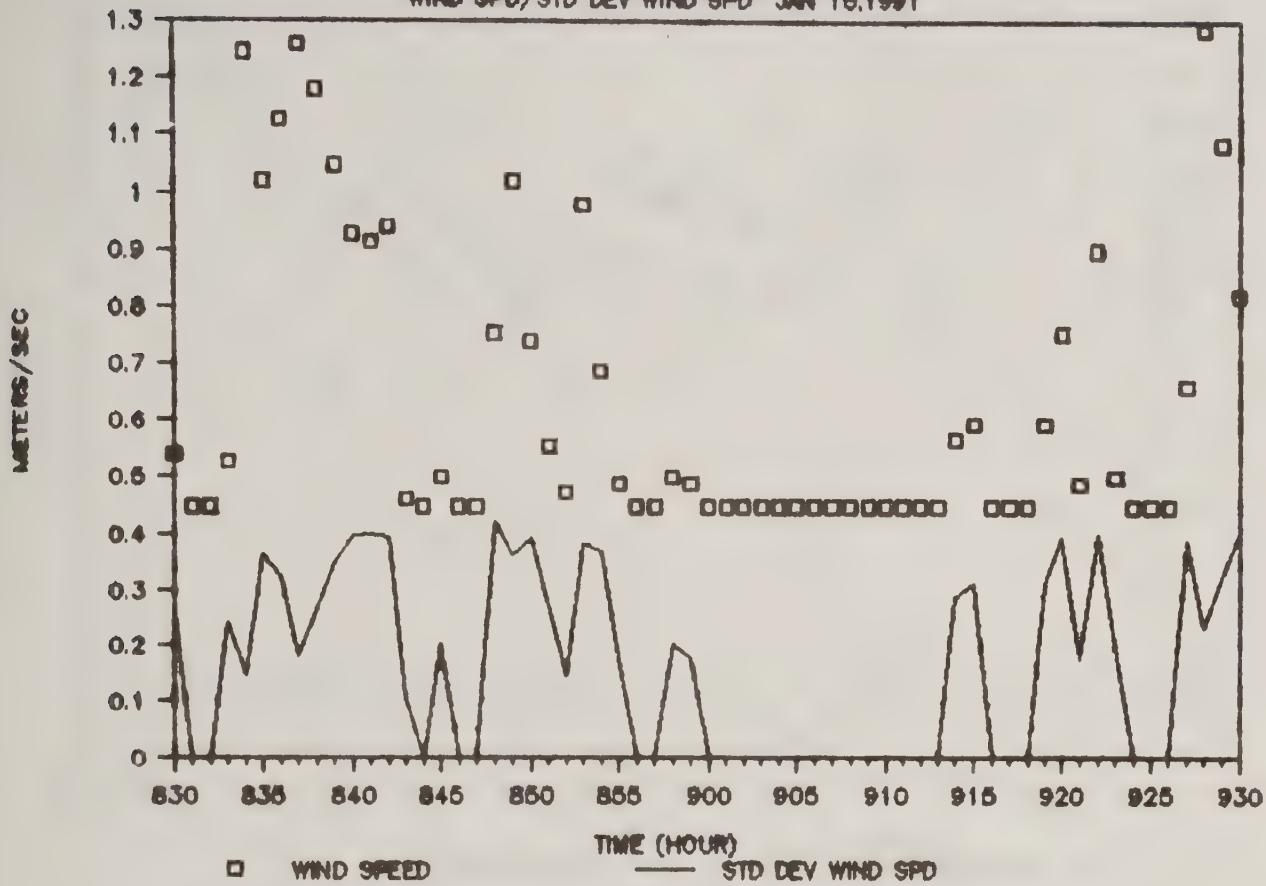
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 15, 1991



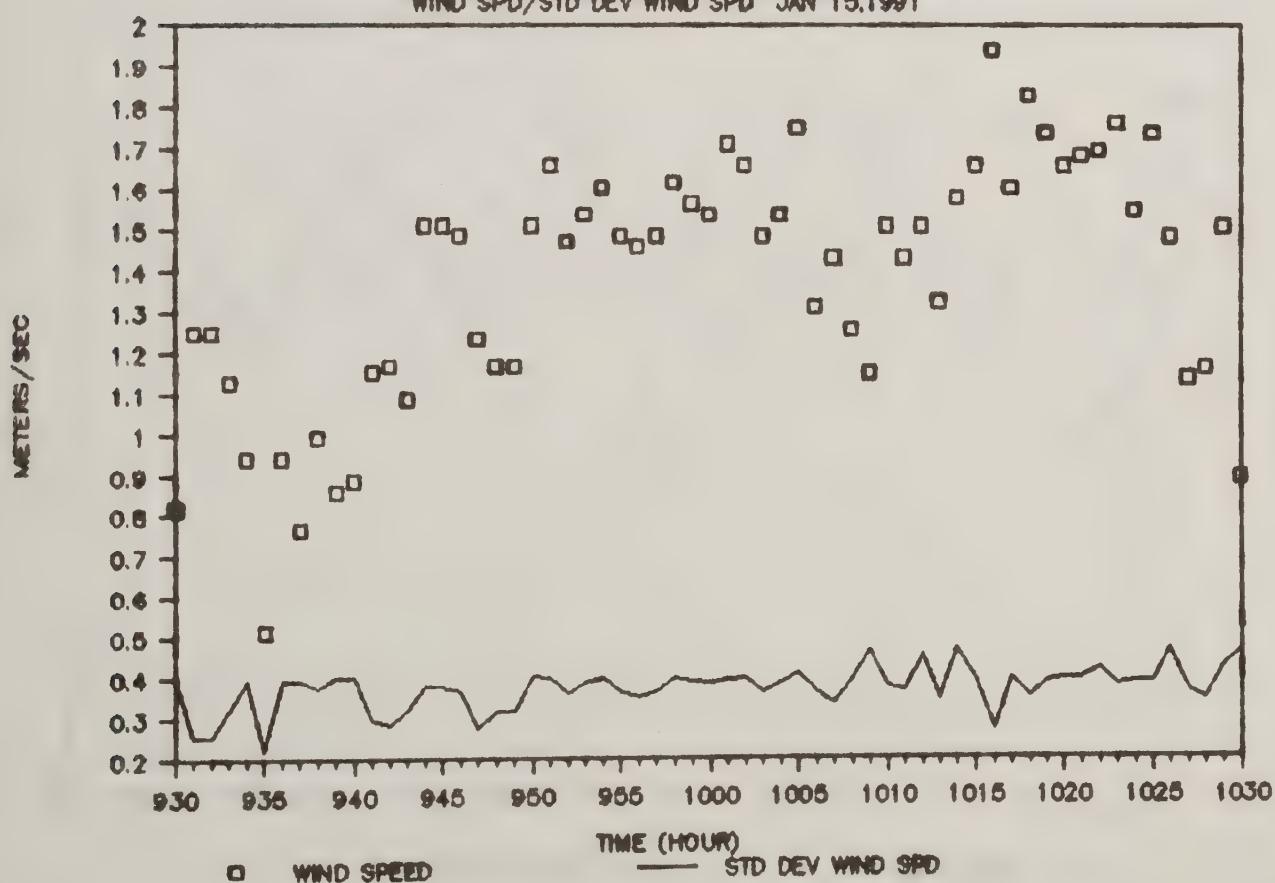
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 15,1991



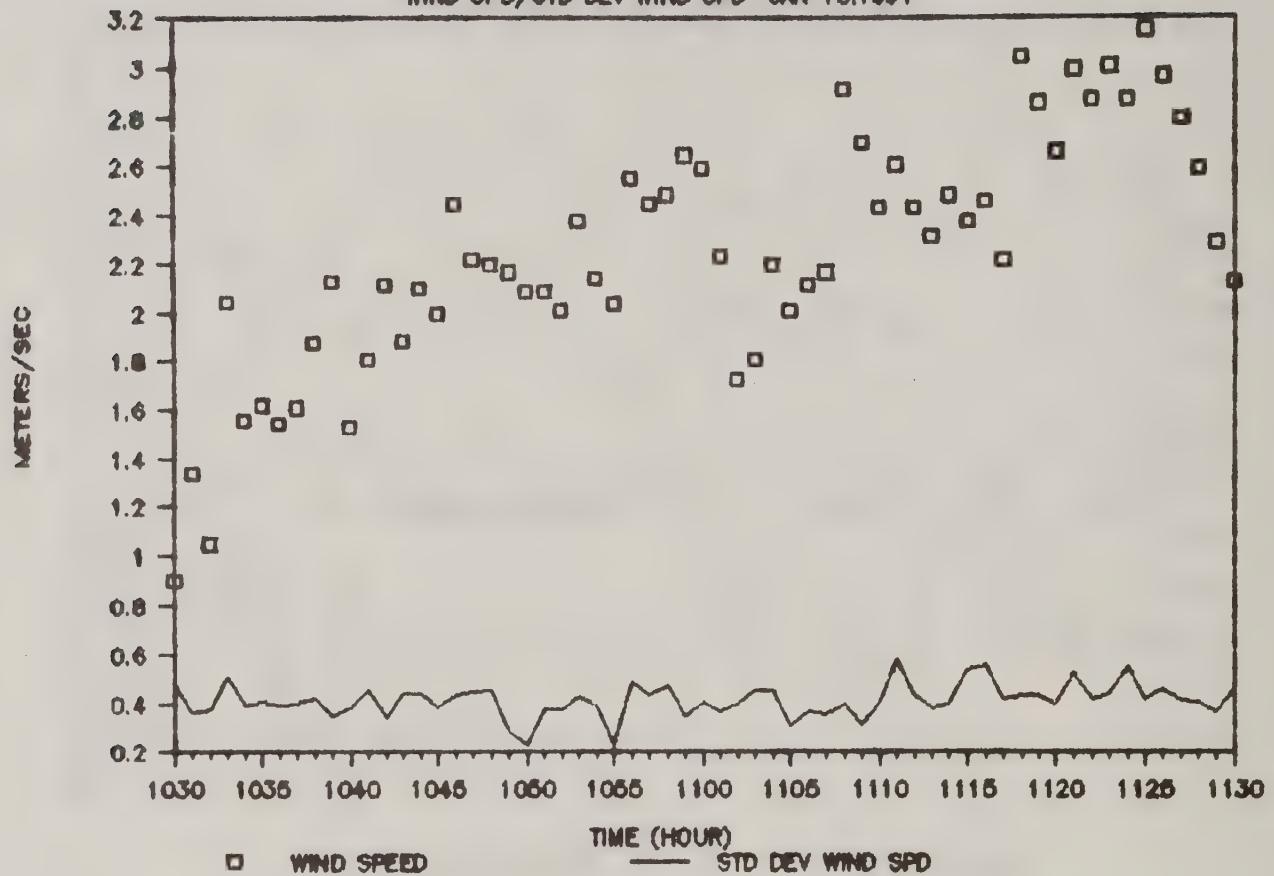
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 15,1991



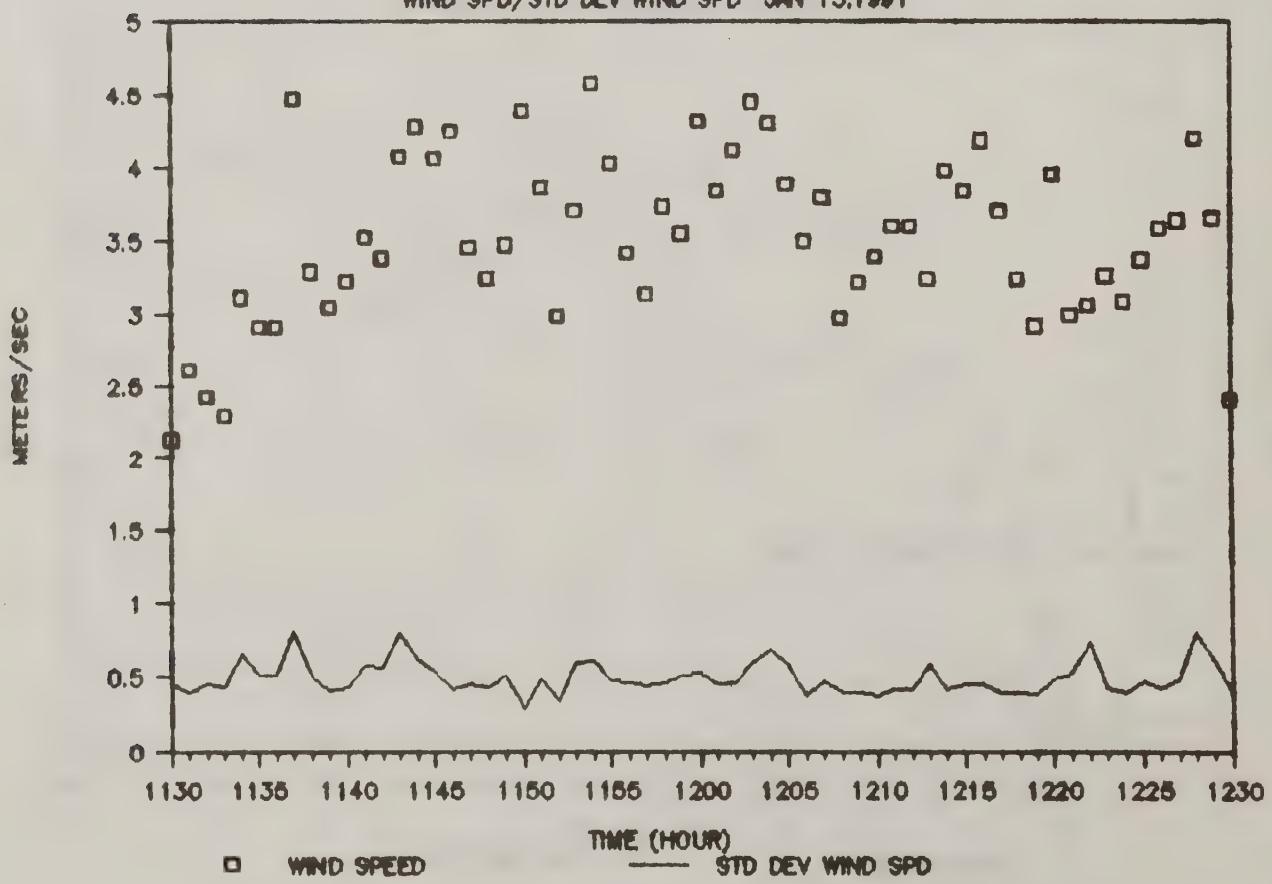
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 15,1991



DAVIS WEATHER DATA STN #2

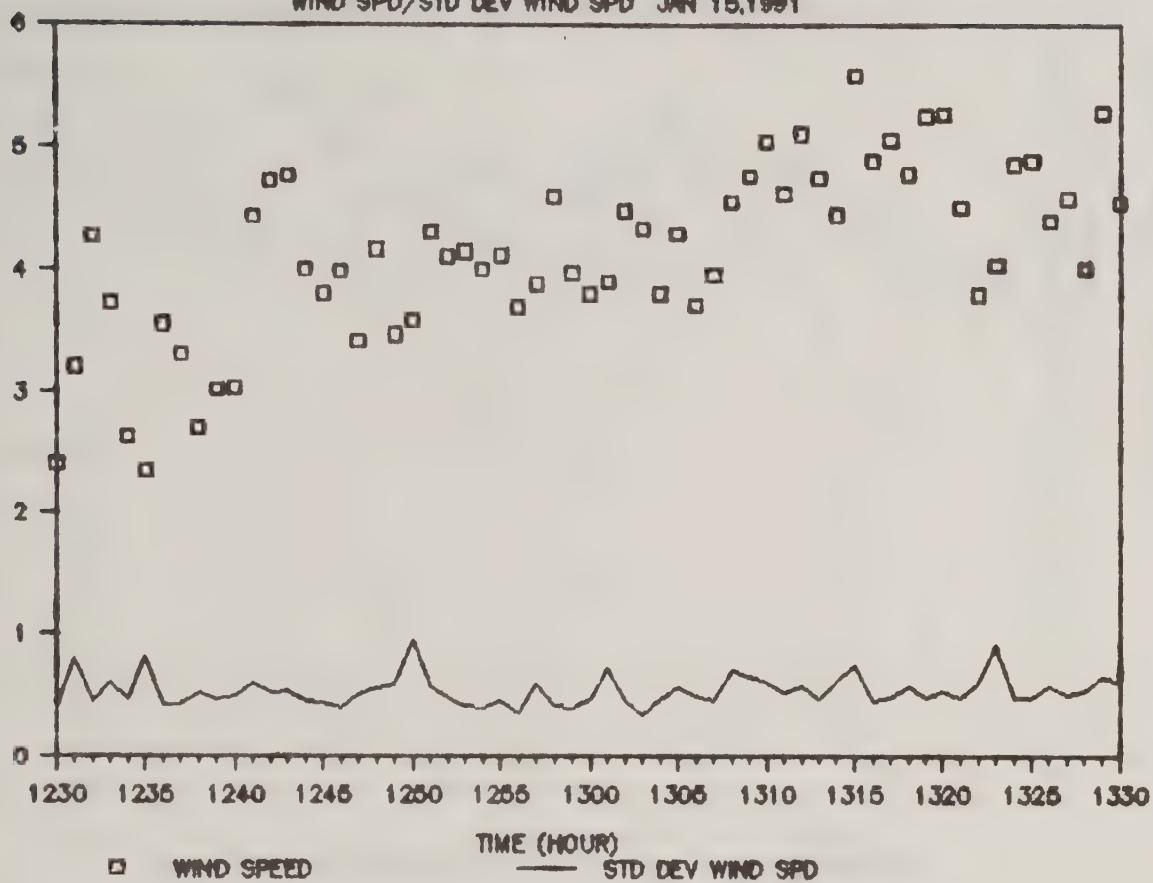
WIND SPD/STD DEV WIND SPD JAN 15,1991



DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 15,1991

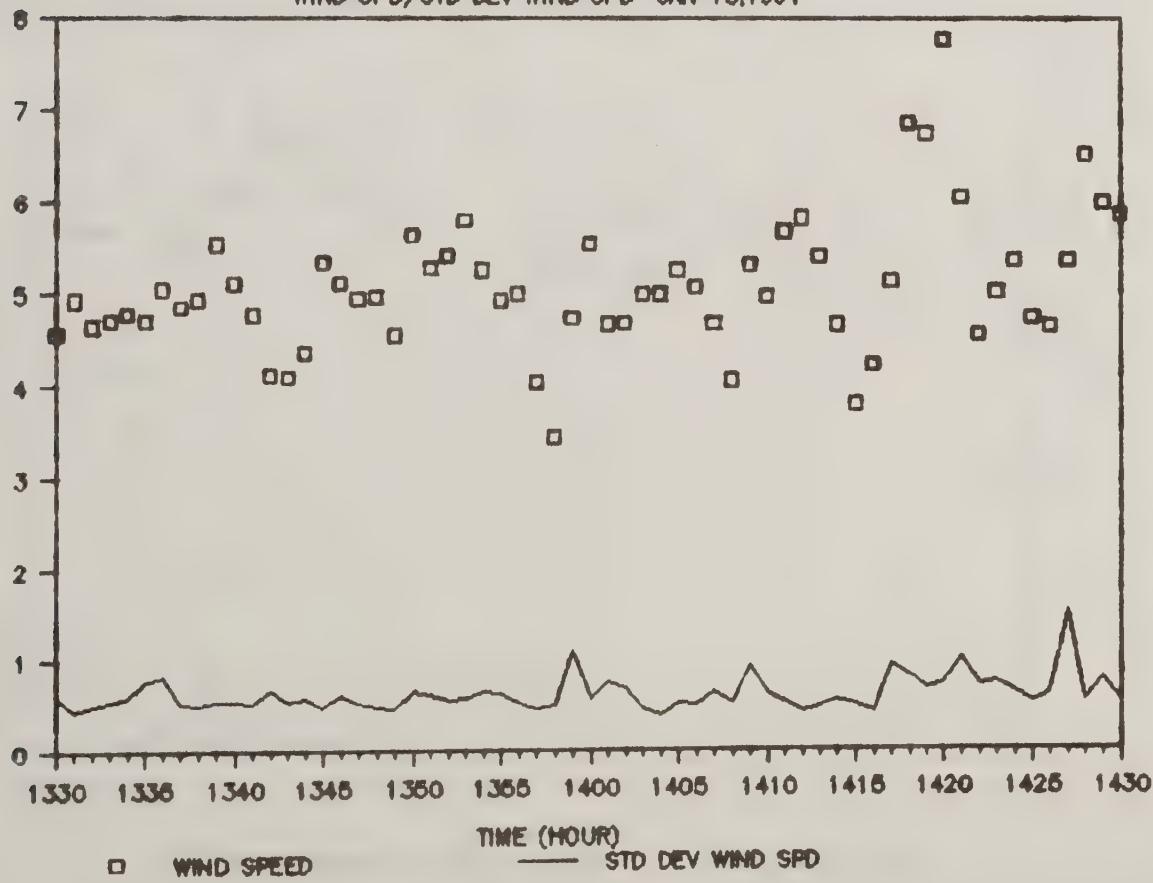
METERS/SEC



DAVIS WEATHER DATA STN #2

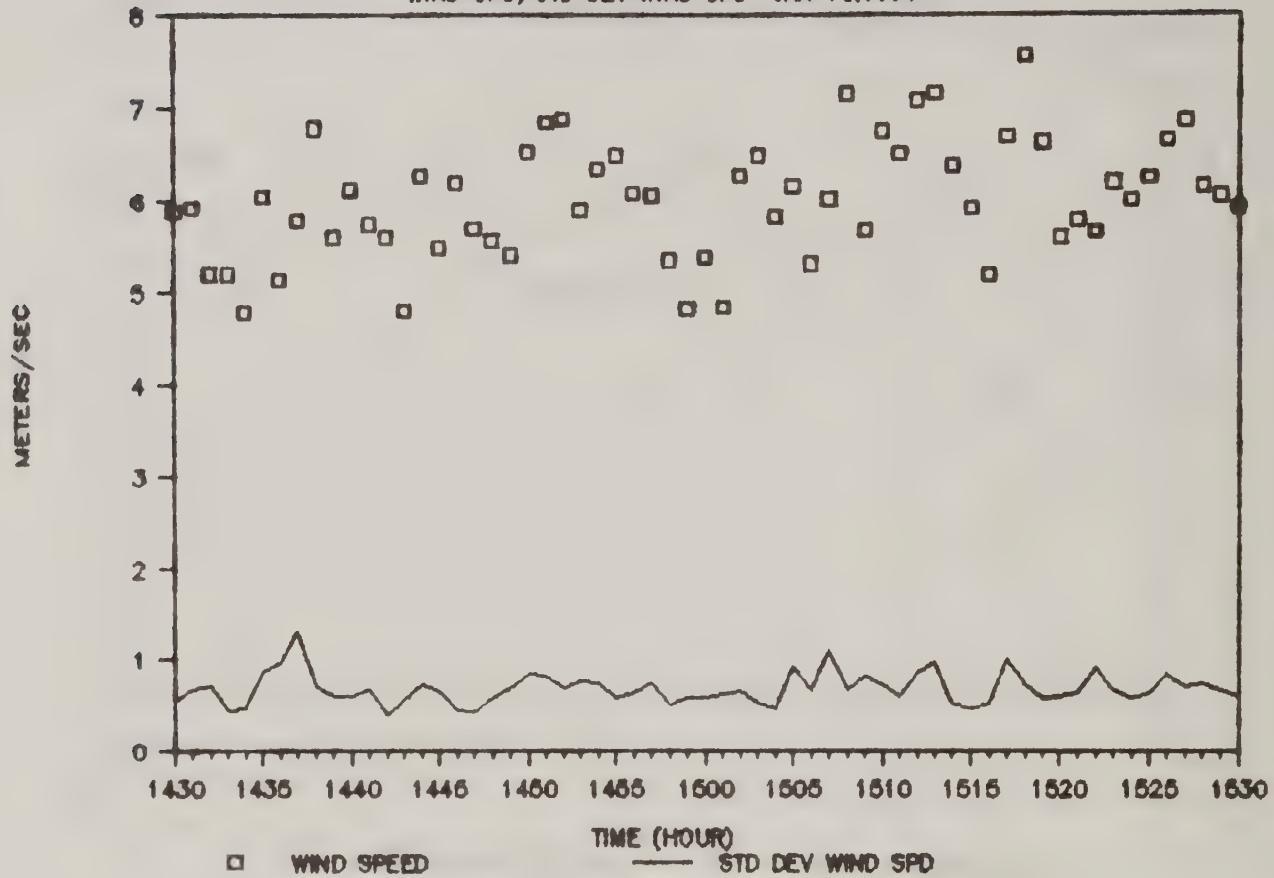
WIND SPD/STD DEV WIND SPD JAN 15,1991

METERS/SEC



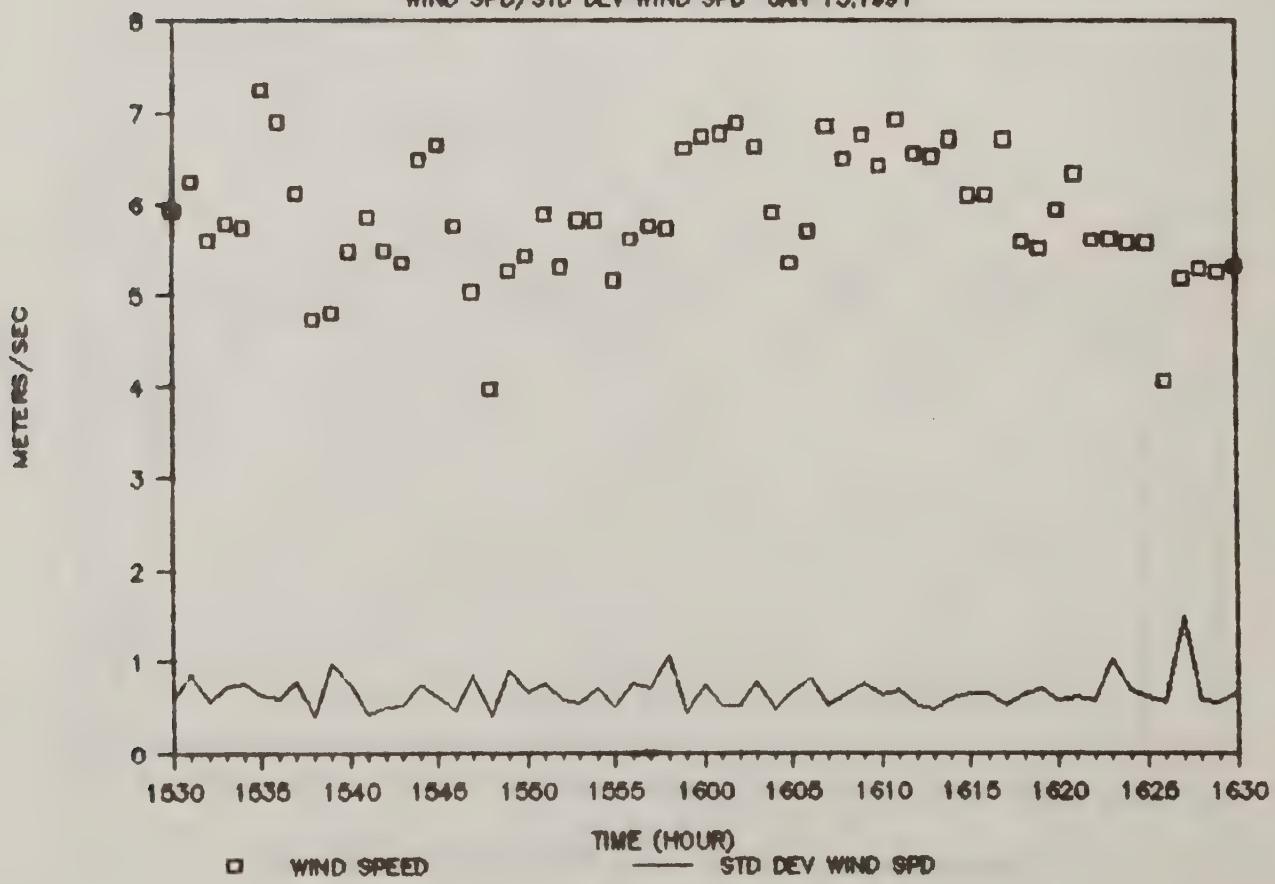
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 15,1991



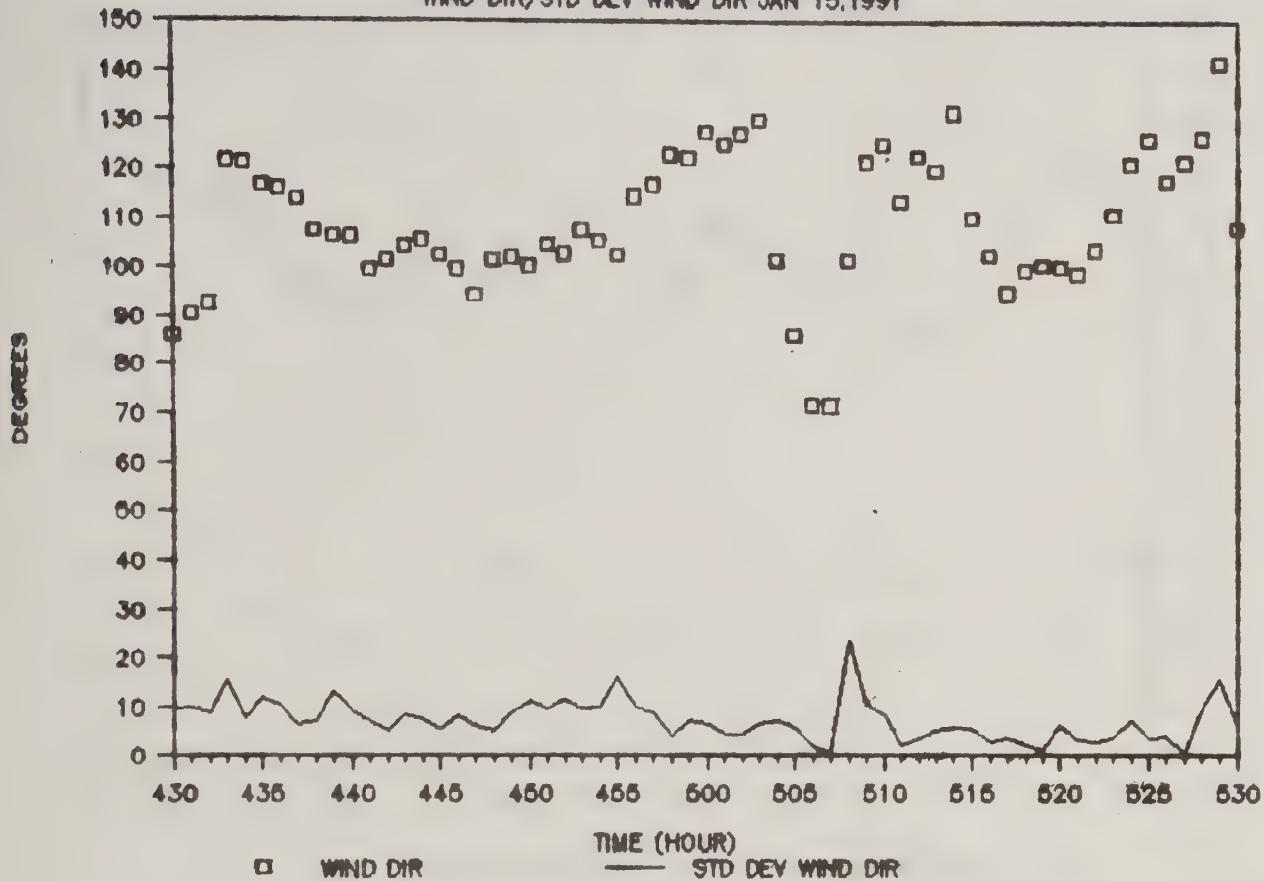
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 15,1991



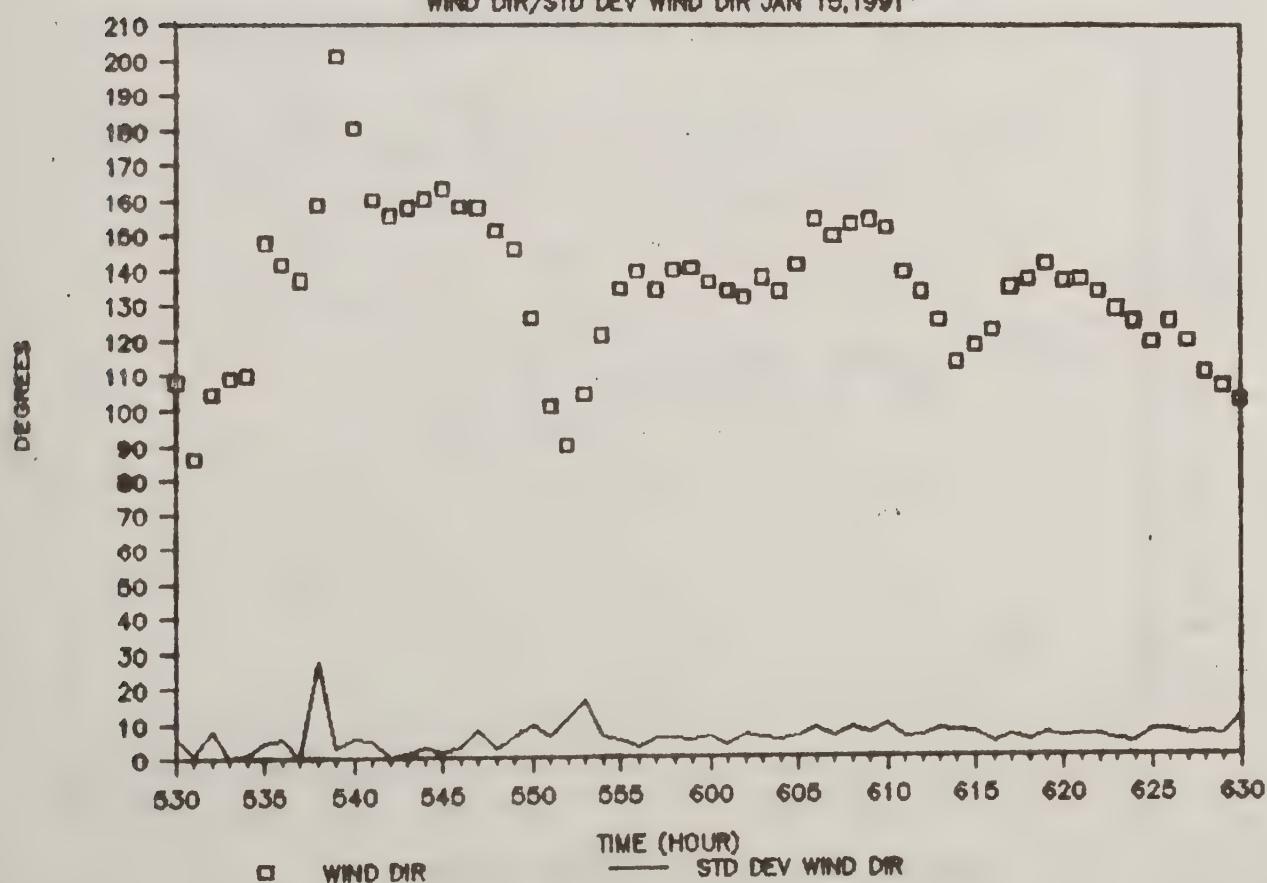
DAVIS WEATHER DATA STN. #2

WIND DIR/STD DEV WIND DIR JAN 15, 1991



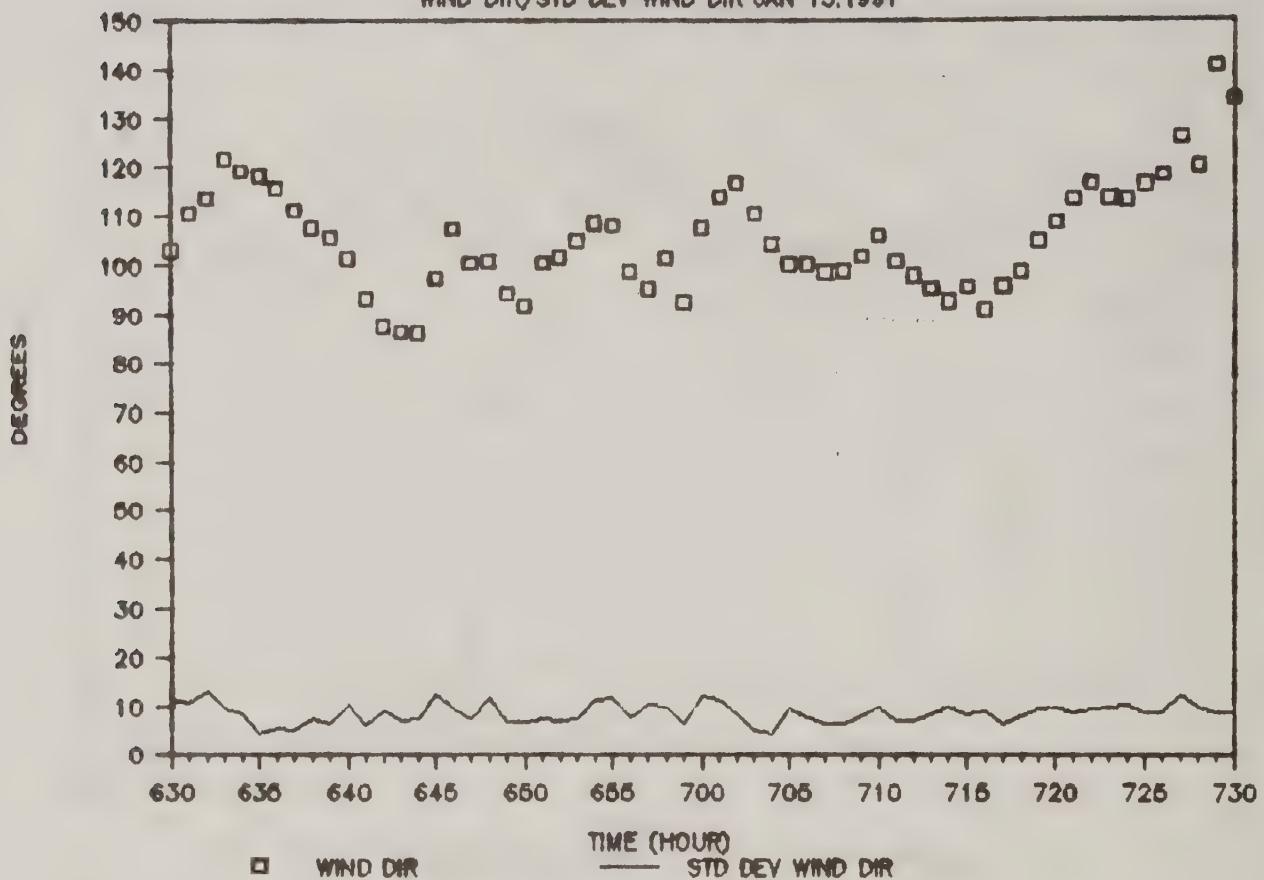
DAVIS WEATHER DATA STN. #2

WIND DIR/STD DEV WIND DIR JAN 15, 1991



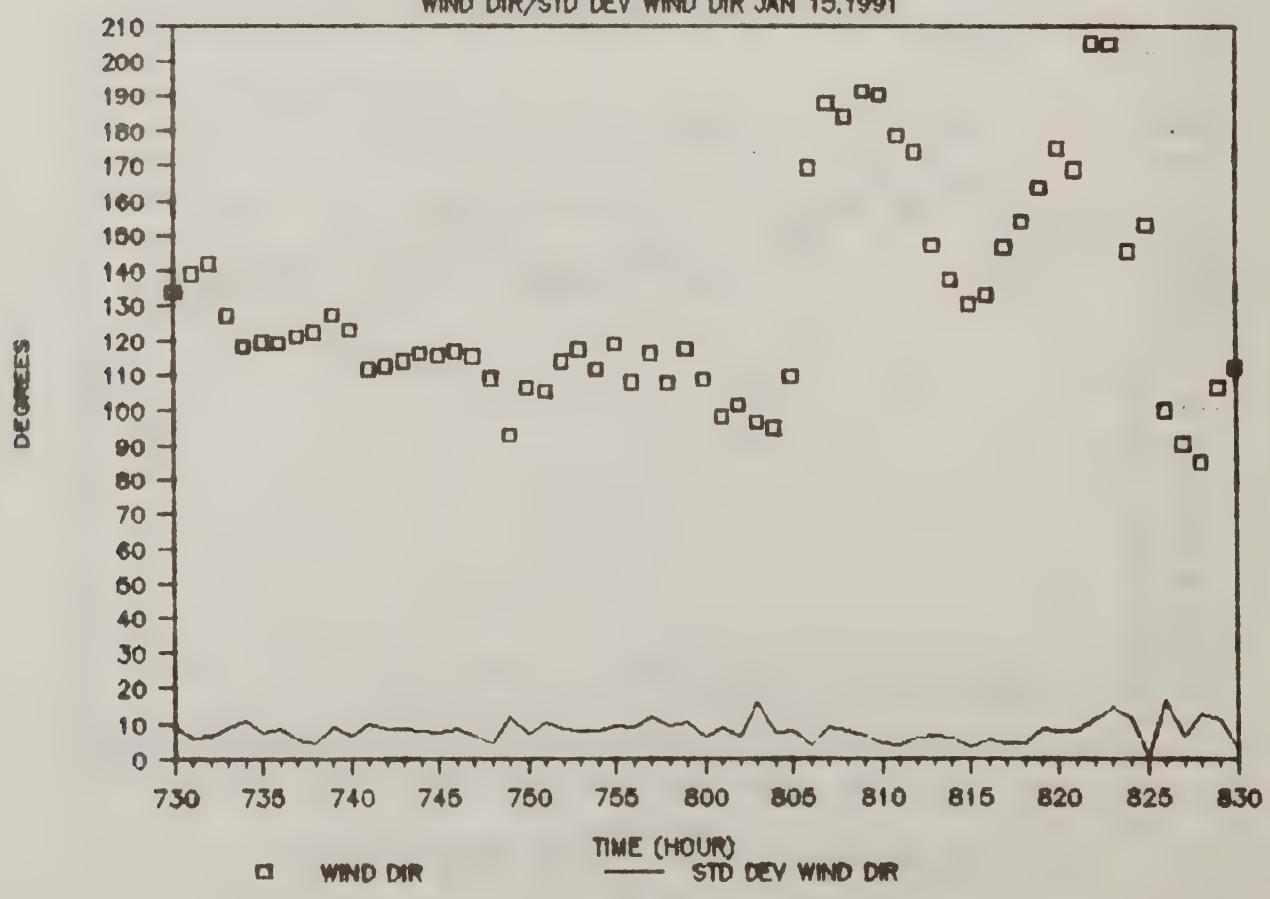
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 15.1991



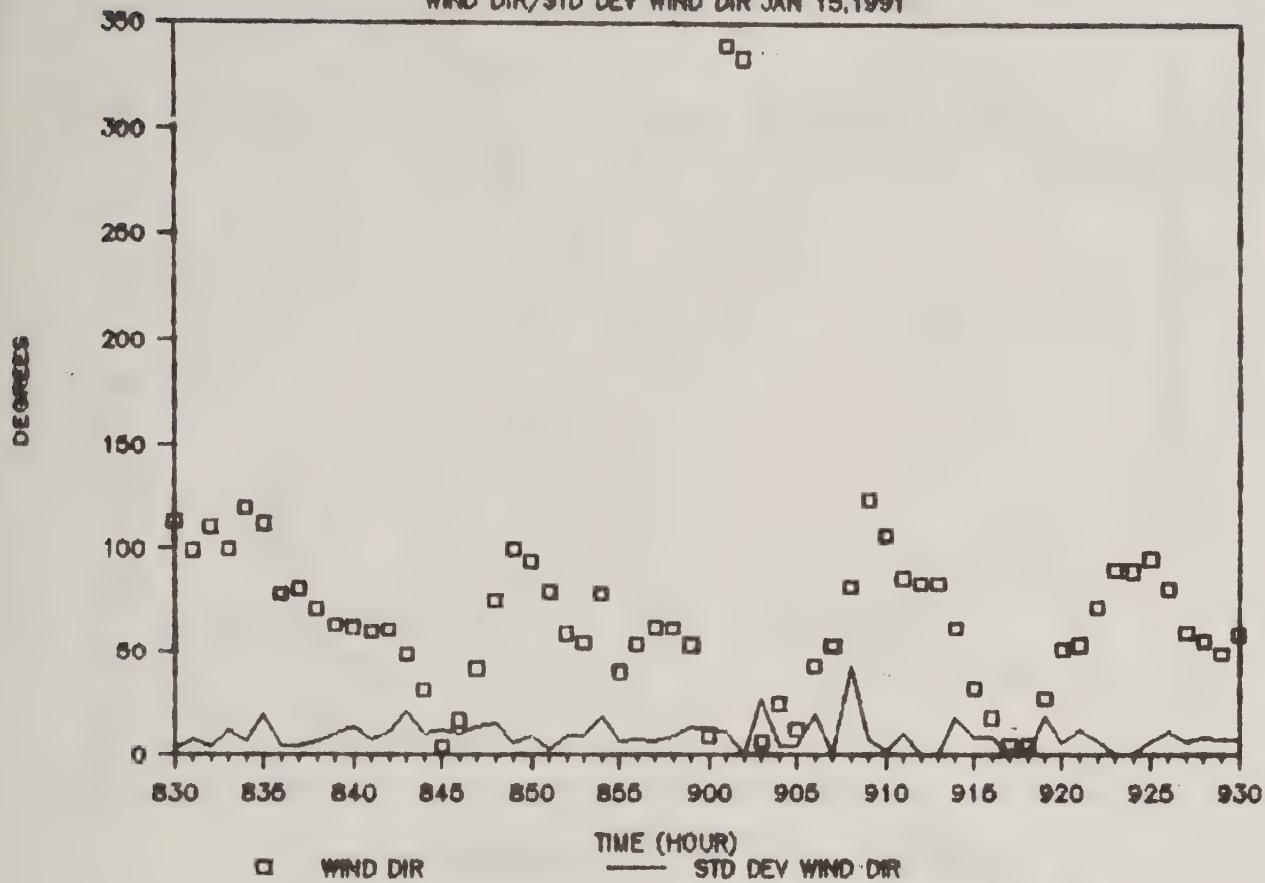
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 15.1991



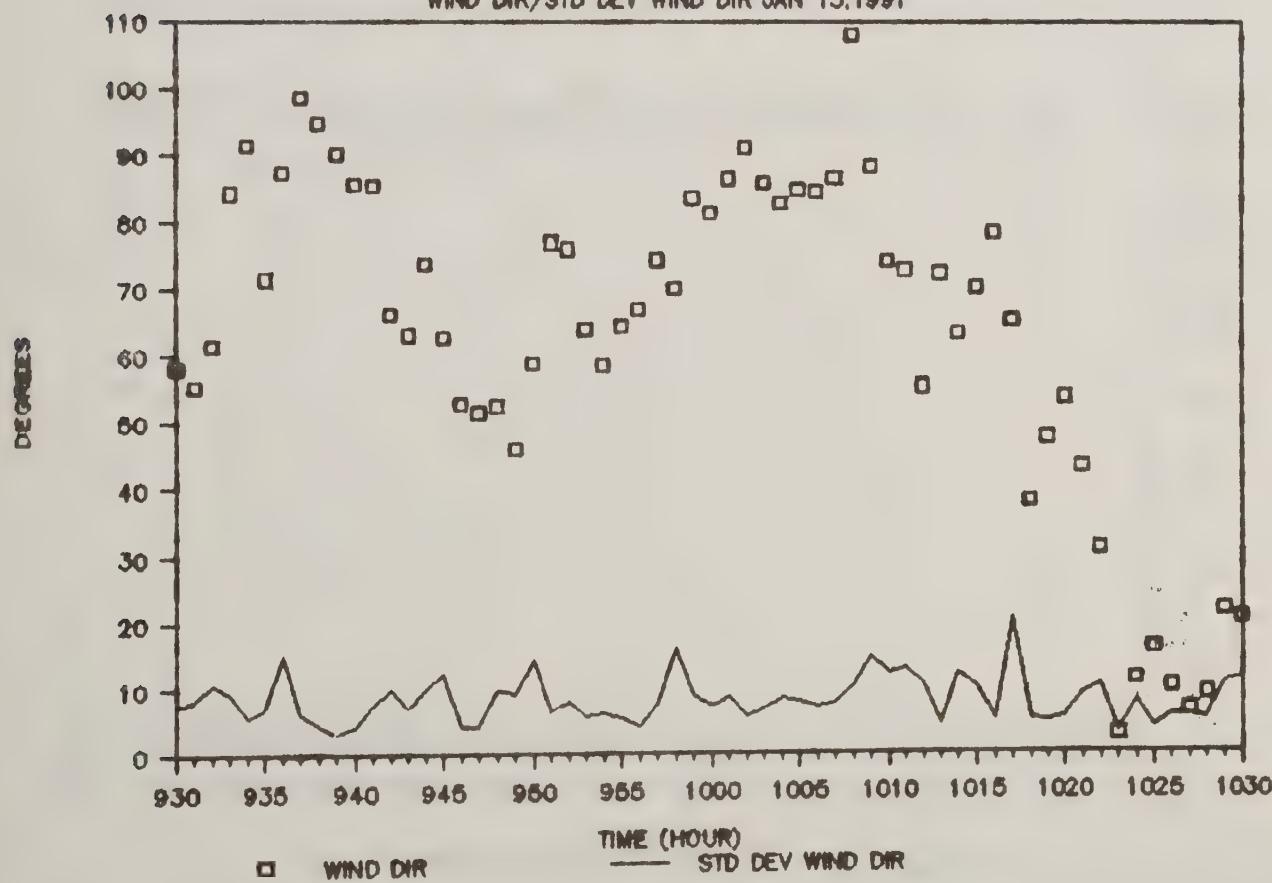
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 15, 1991



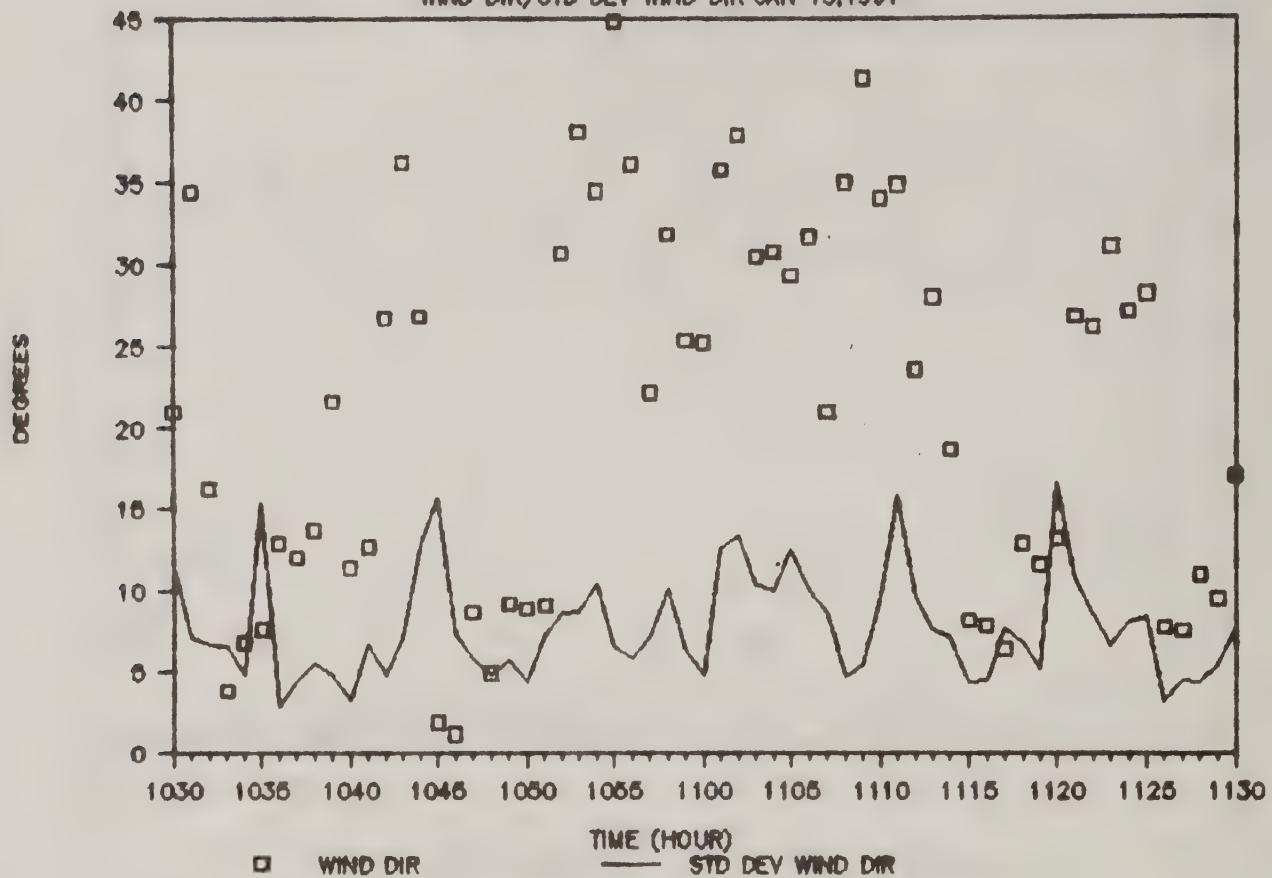
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 15, 1991



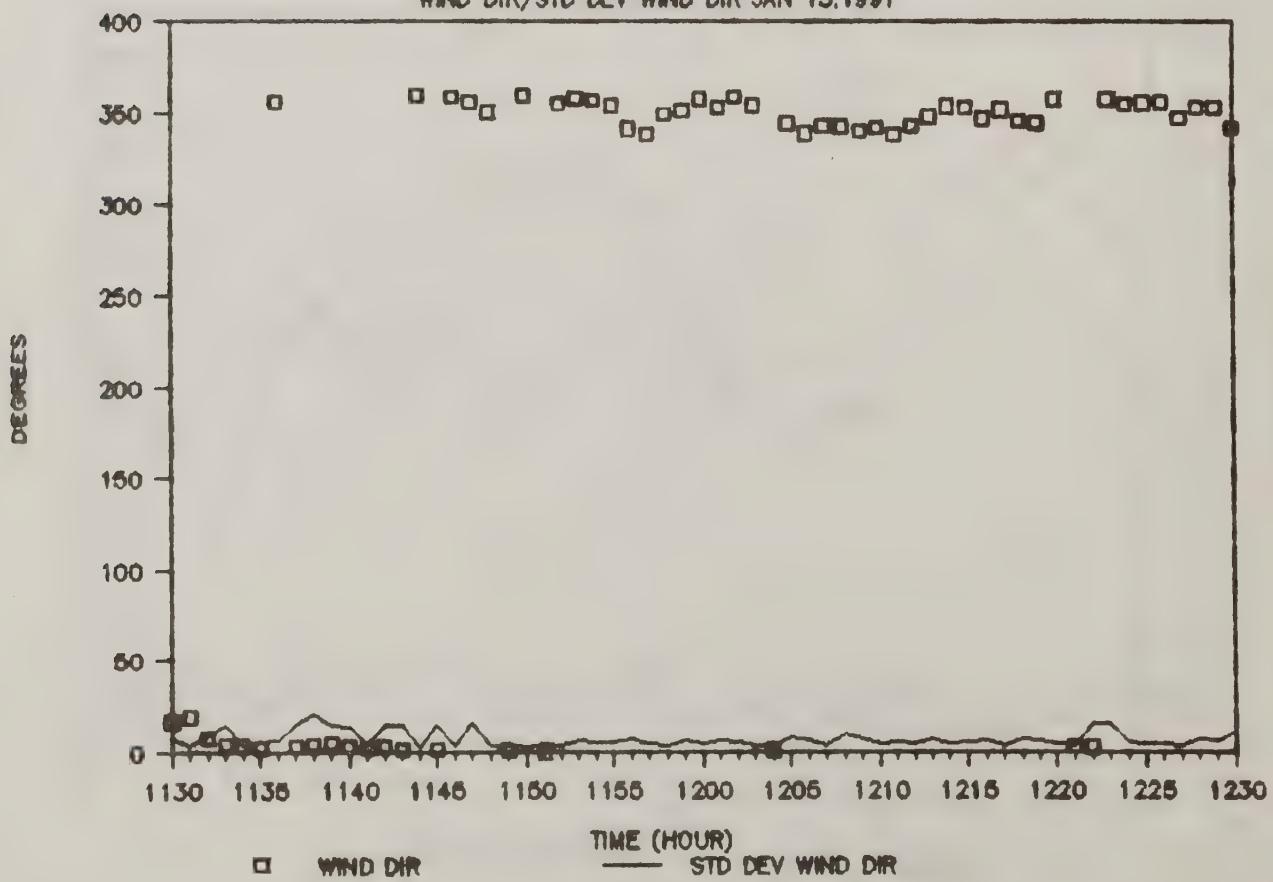
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 15,1991



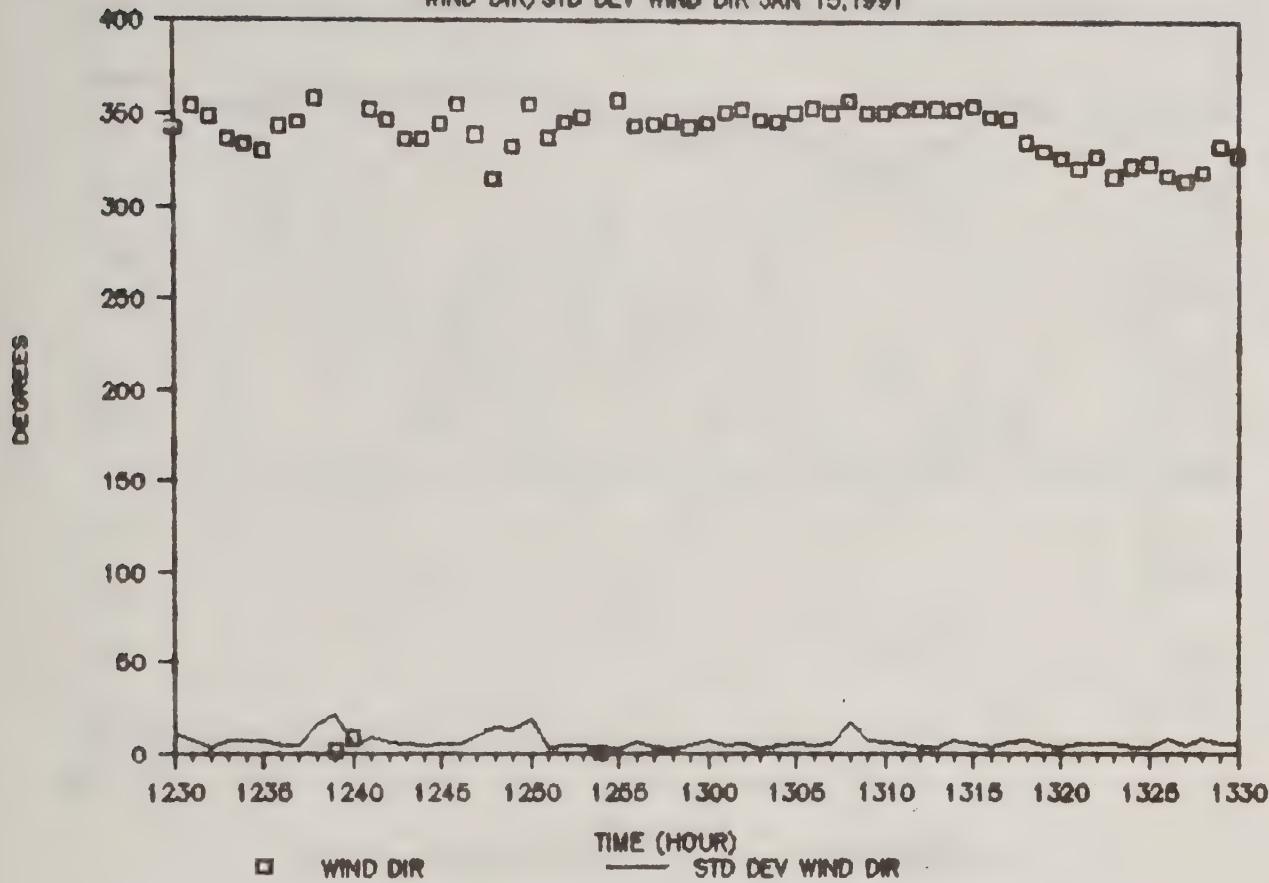
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 15,1991



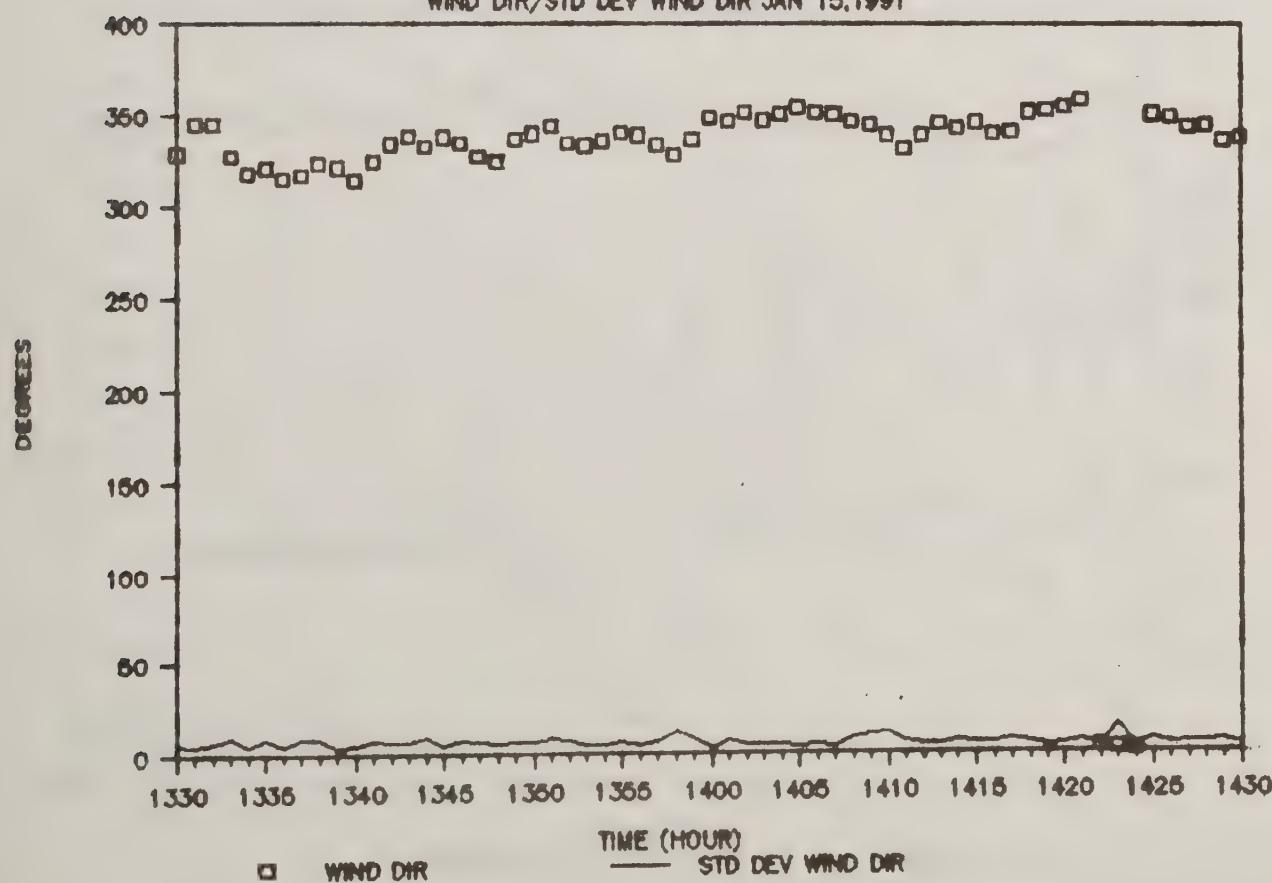
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 15, 1991



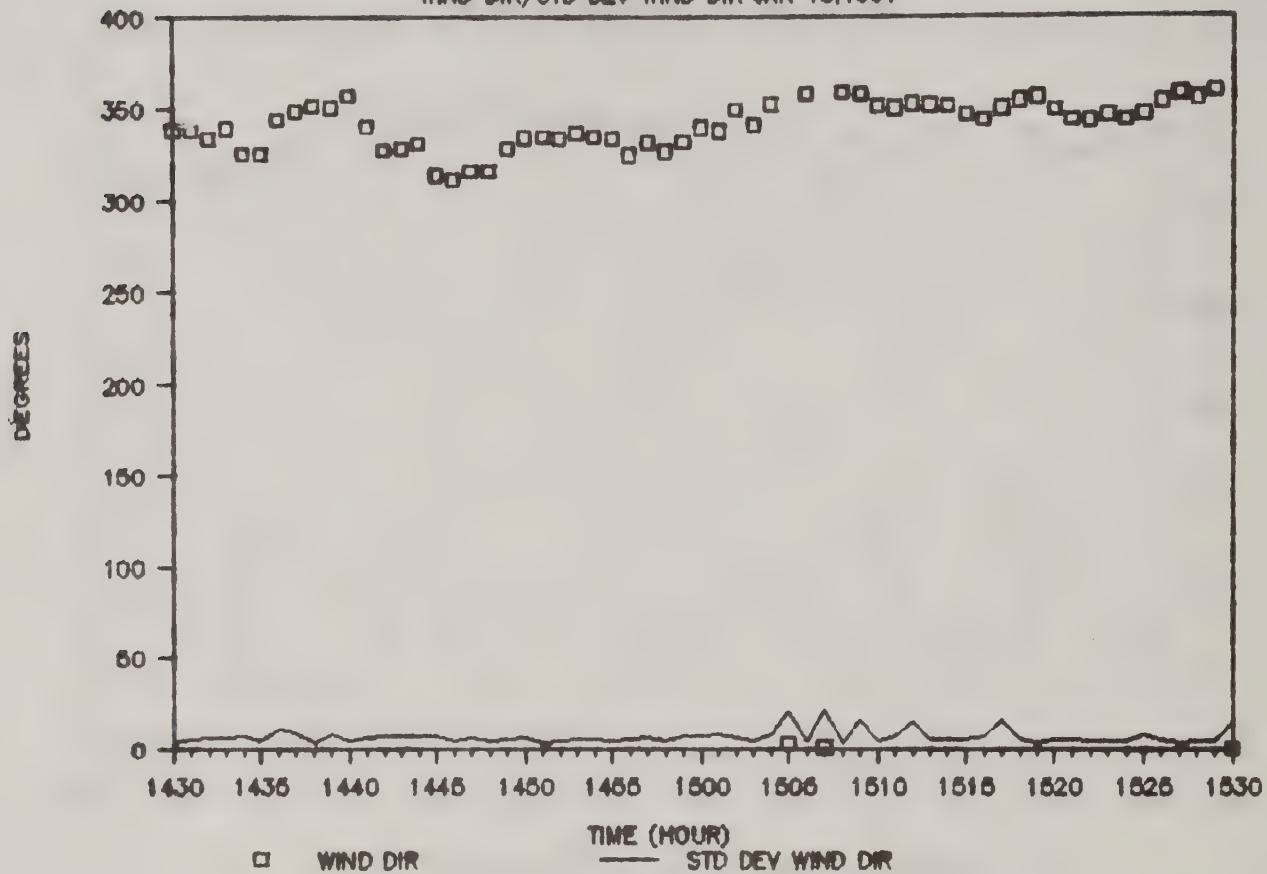
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 15, 1991



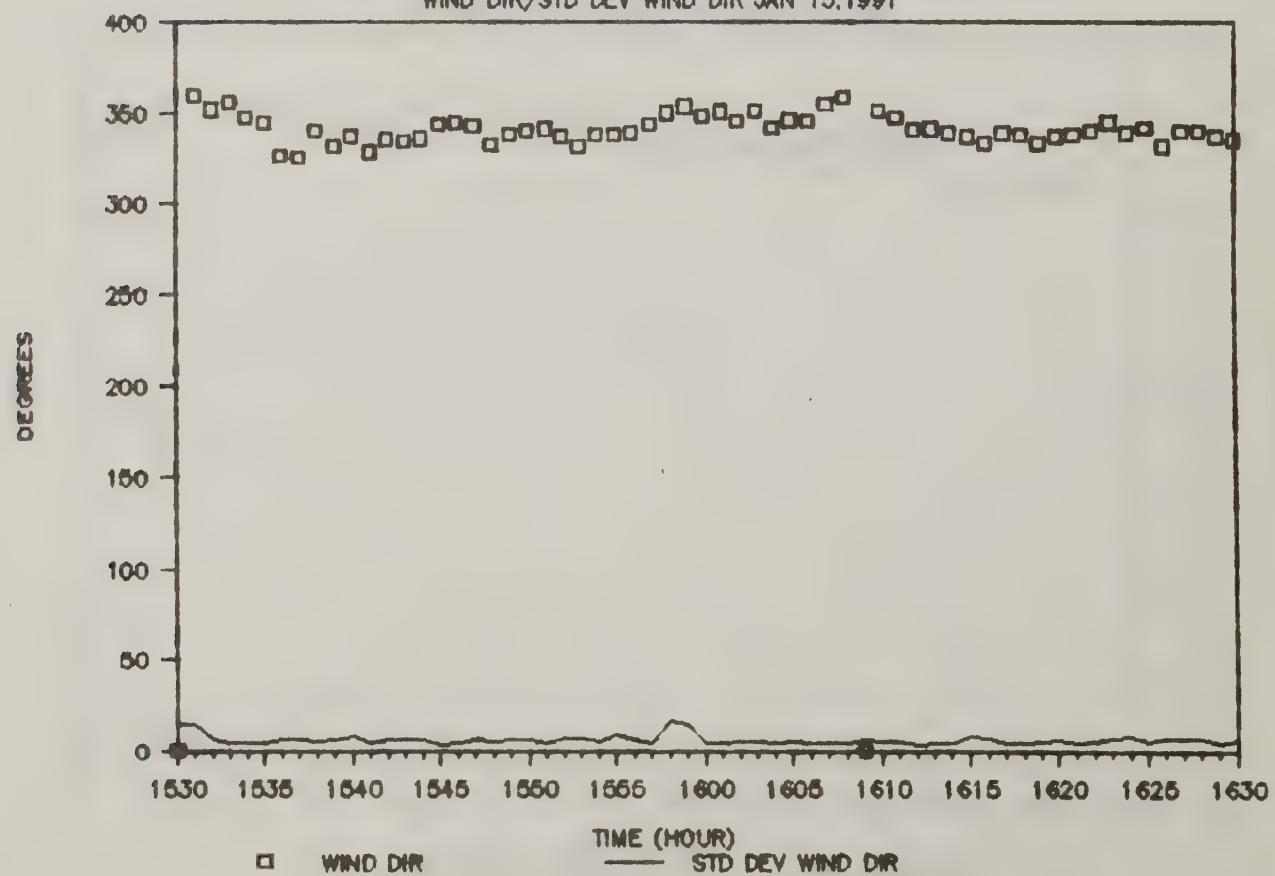
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 15, 1991



DAVIS WEATHER DATA STN #2

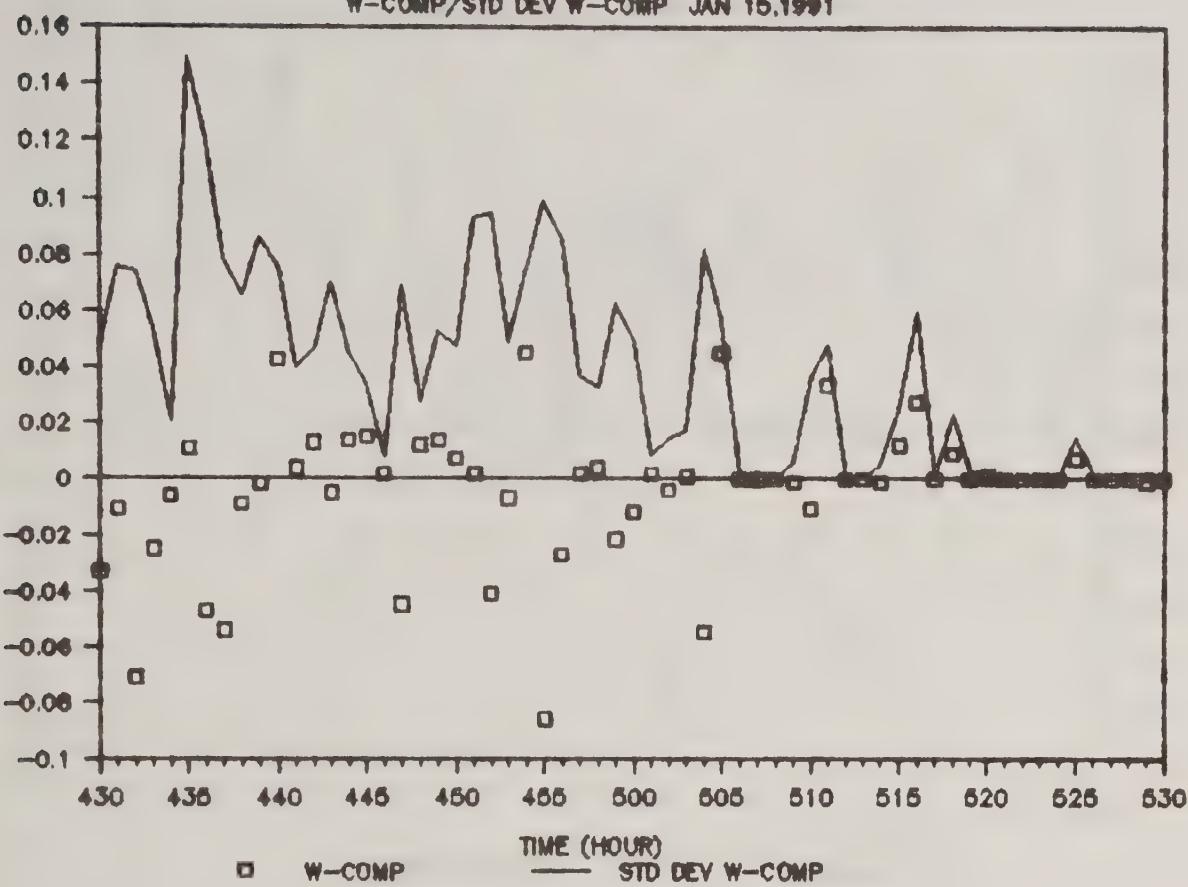
WIND DIR/STD DEV WIND DIR JAN 15, 1991



DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 15,1991

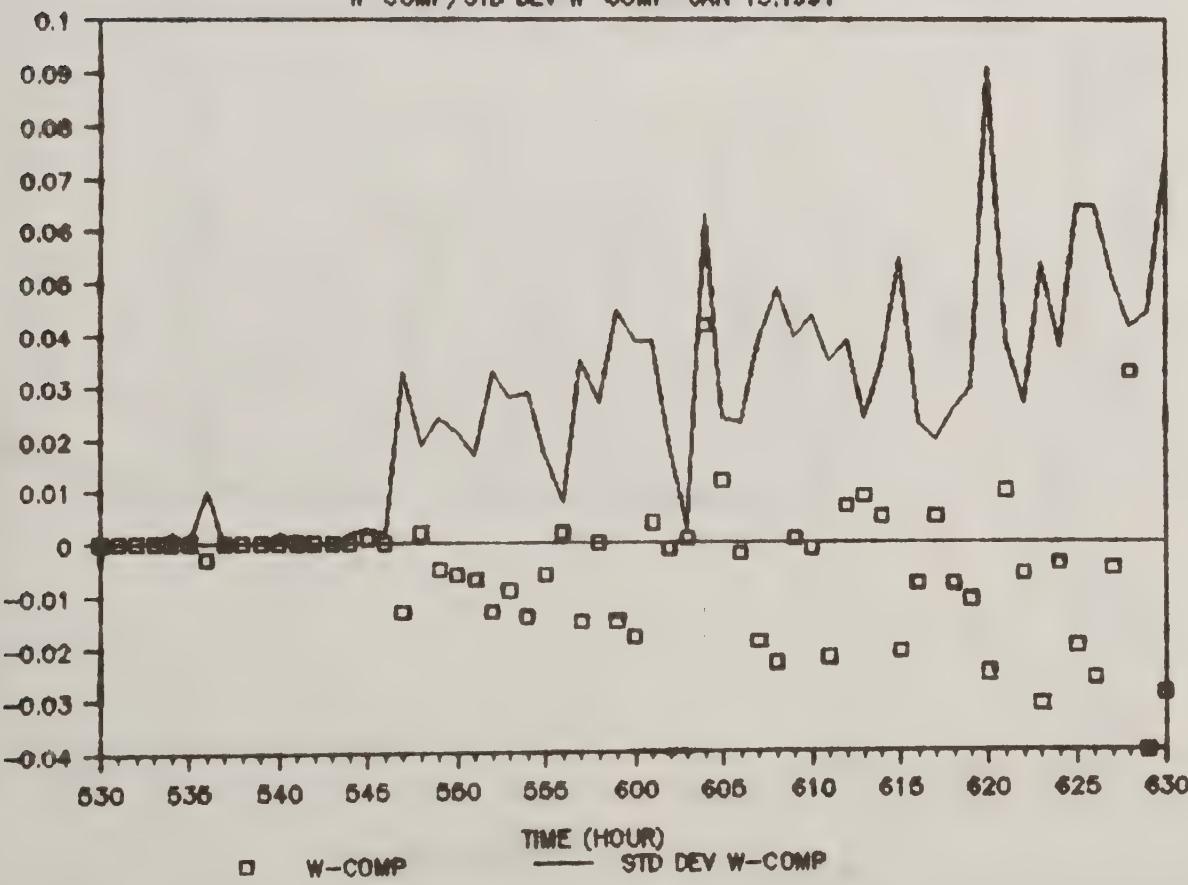
METERS / SEC



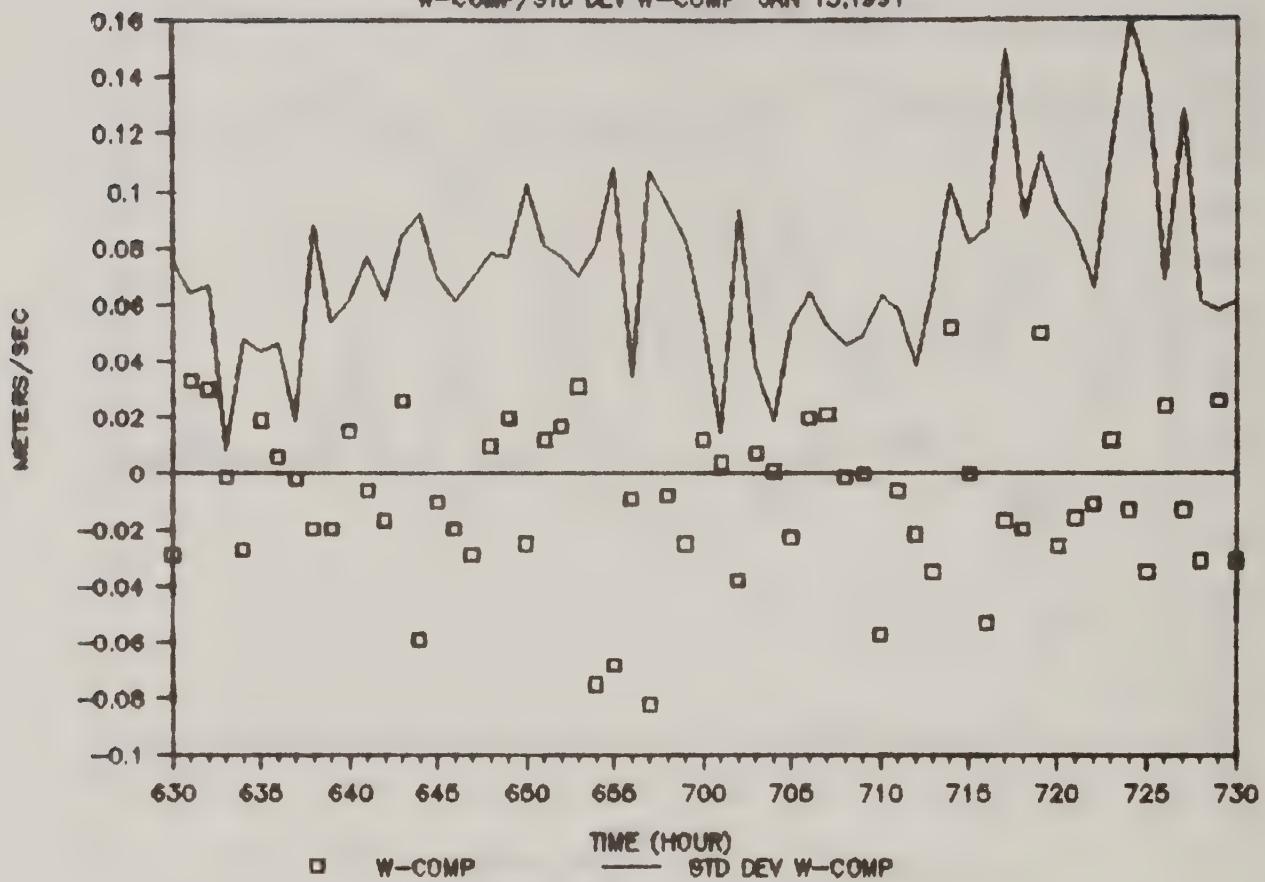
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 15,1991

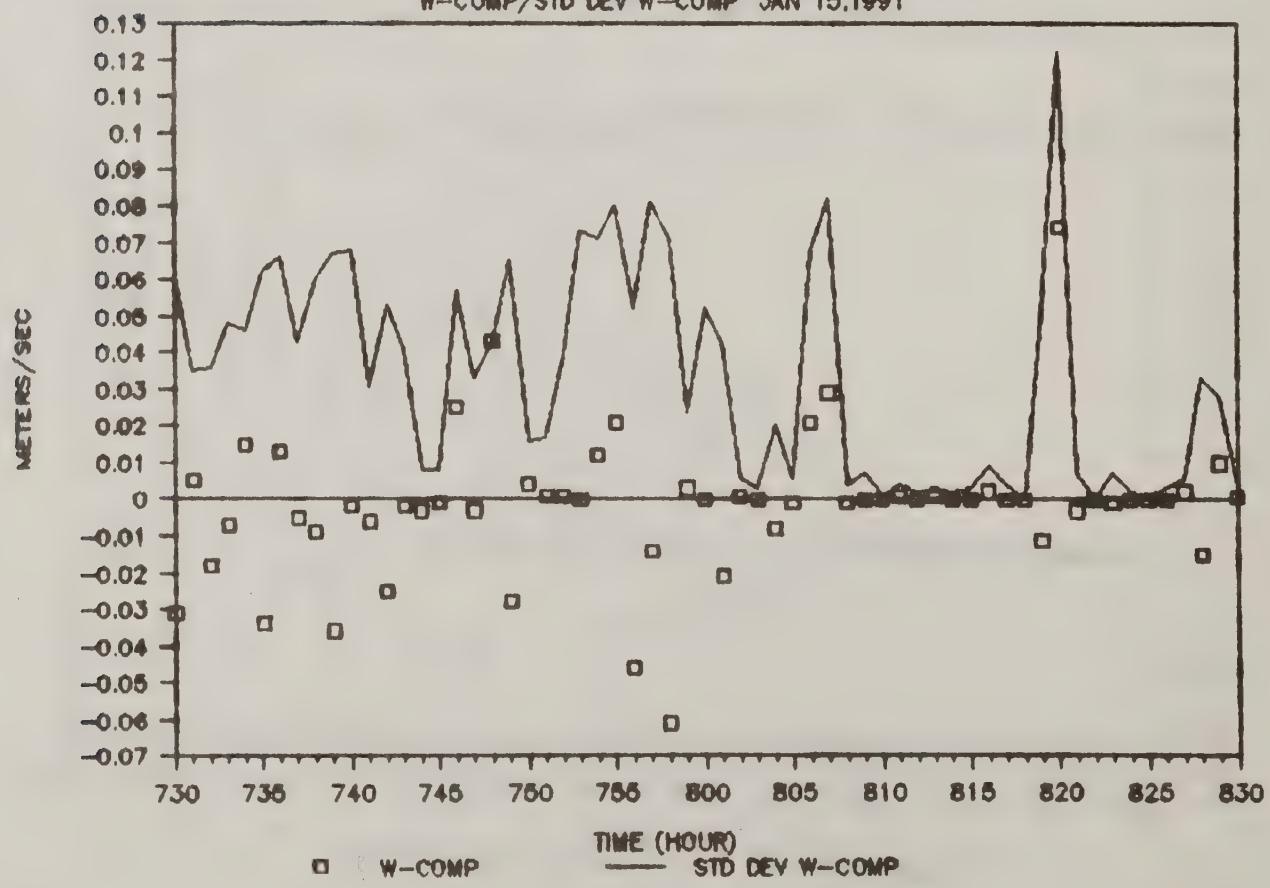
METERS / SEC



DAVIS WEATHER DATA STN #2
W-COMP/STD DEV W-COMP JAN 15,1991

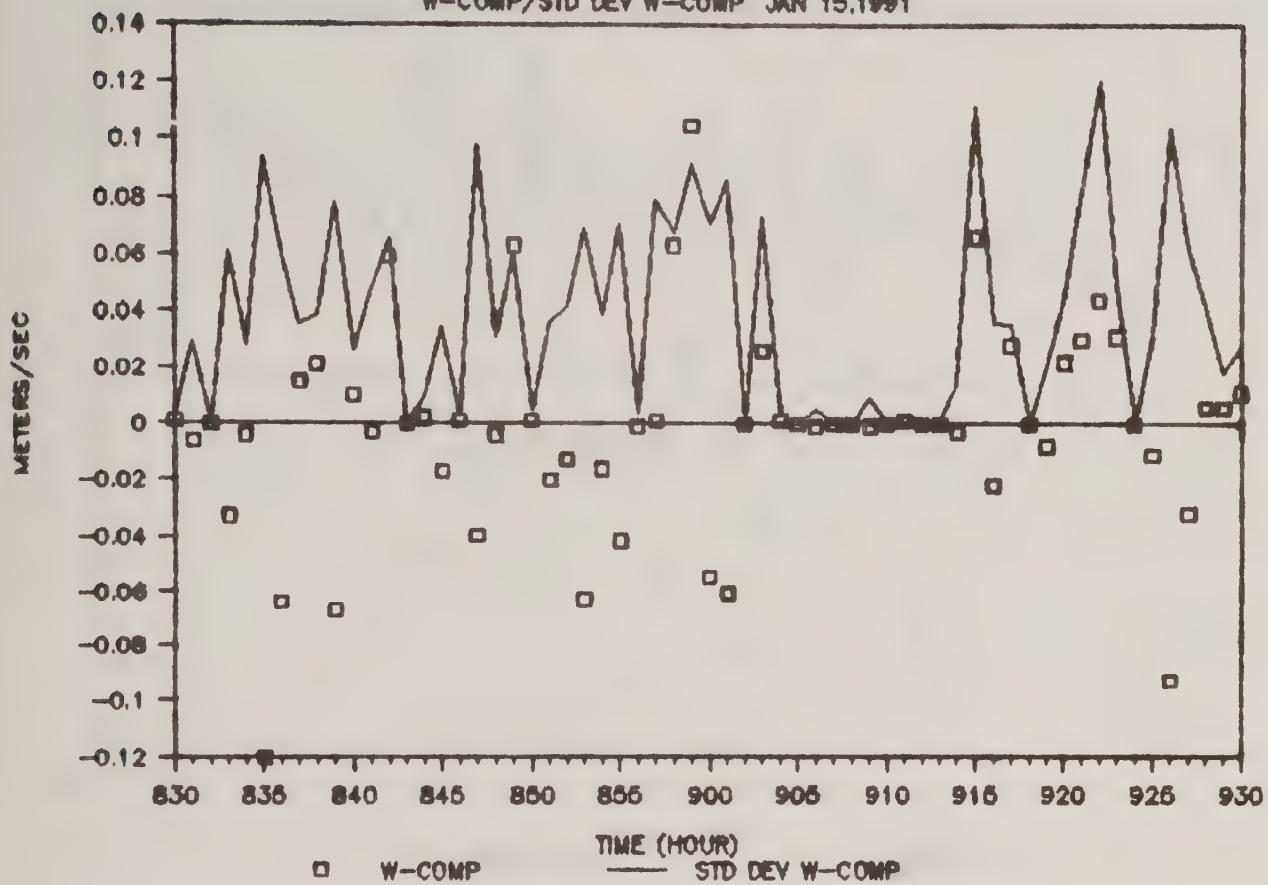


DAVIS WEATHER DATA STN #2
W-COMP/STD DEV W-COMP JAN 15,1991



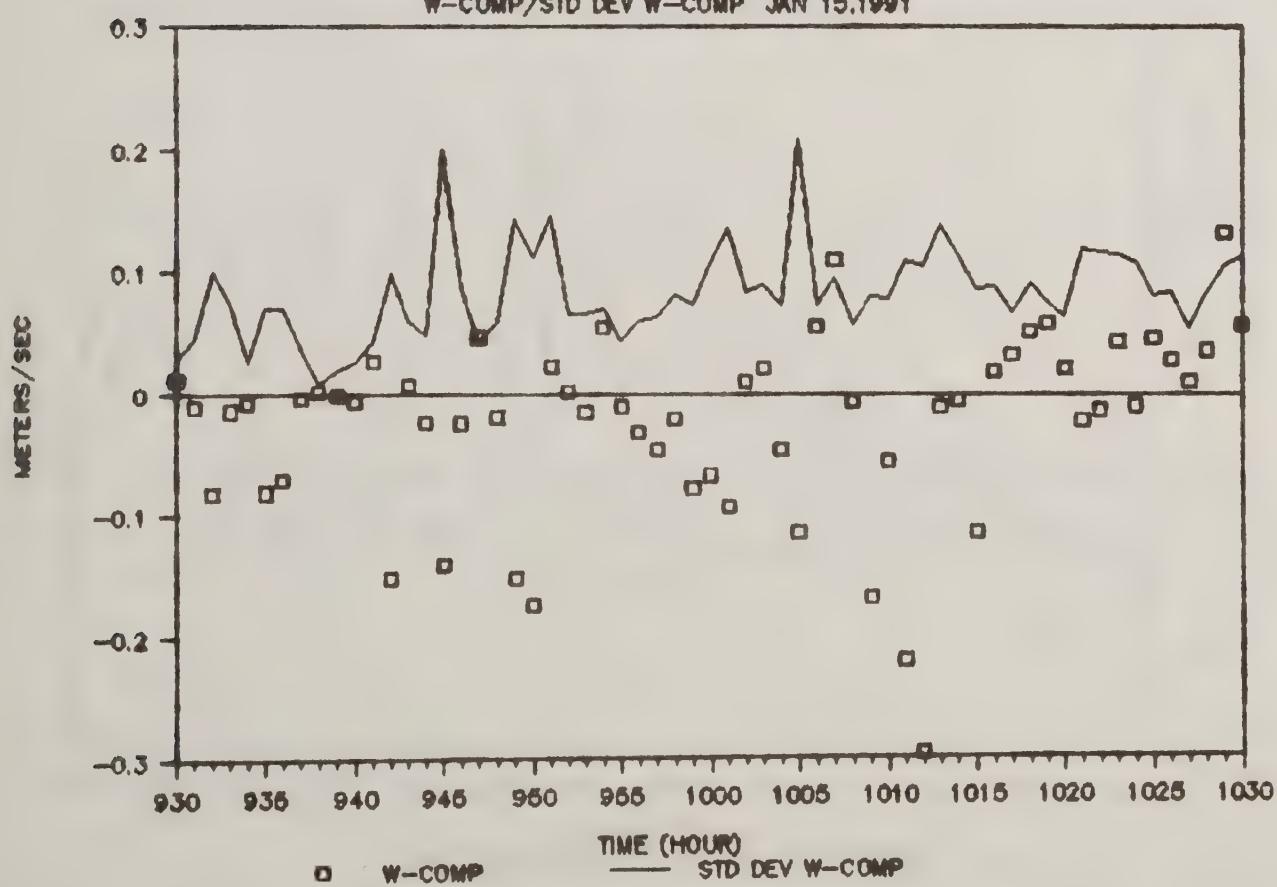
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 15,1991



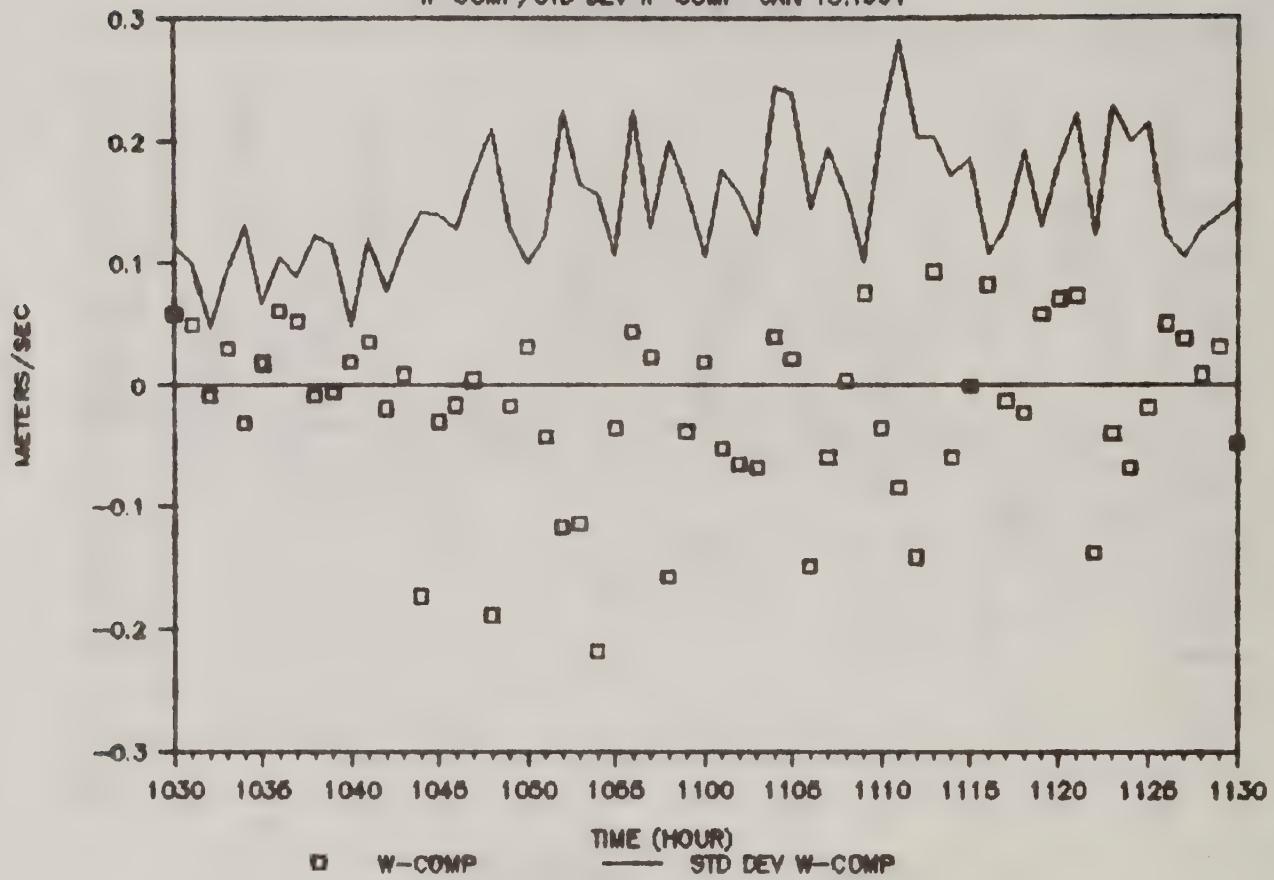
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 15,1991



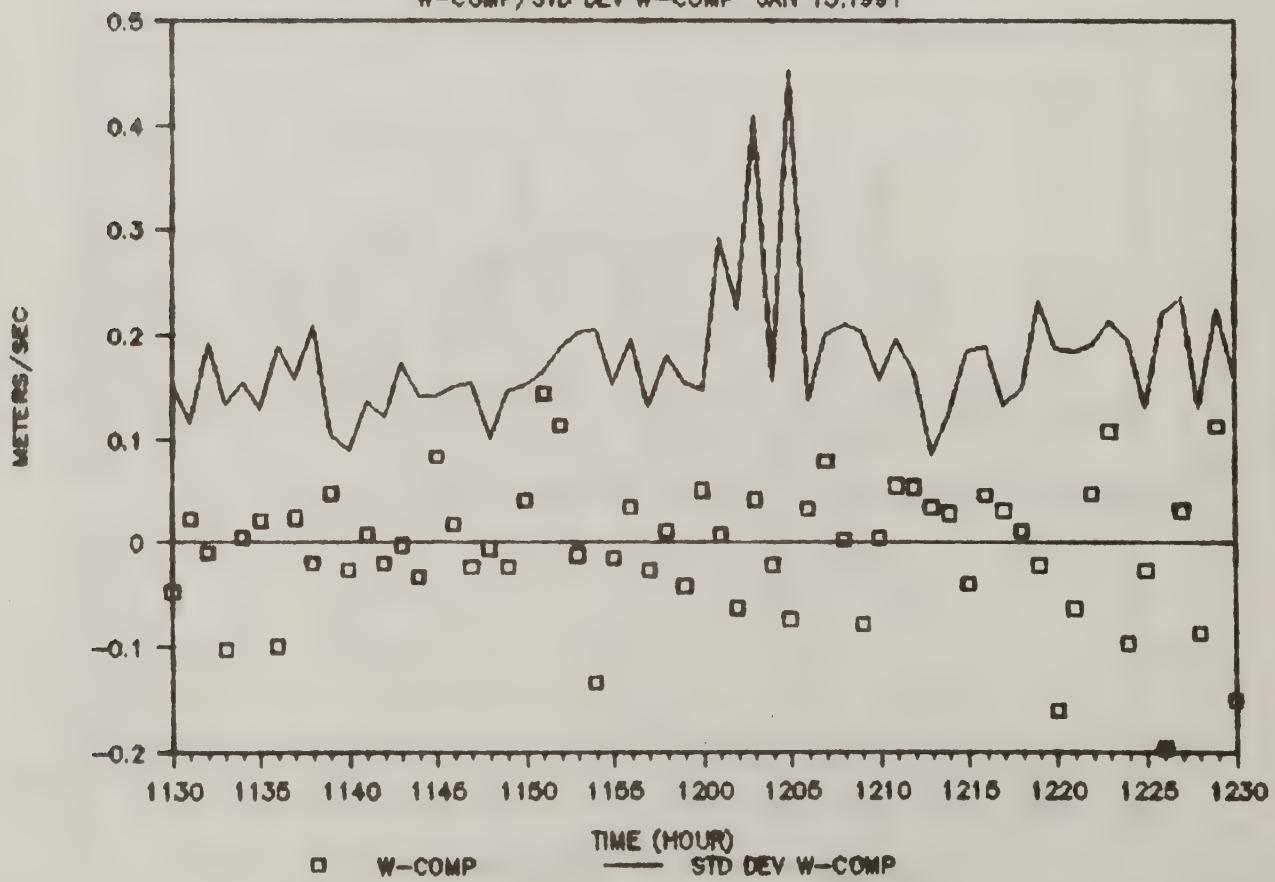
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 15.1991



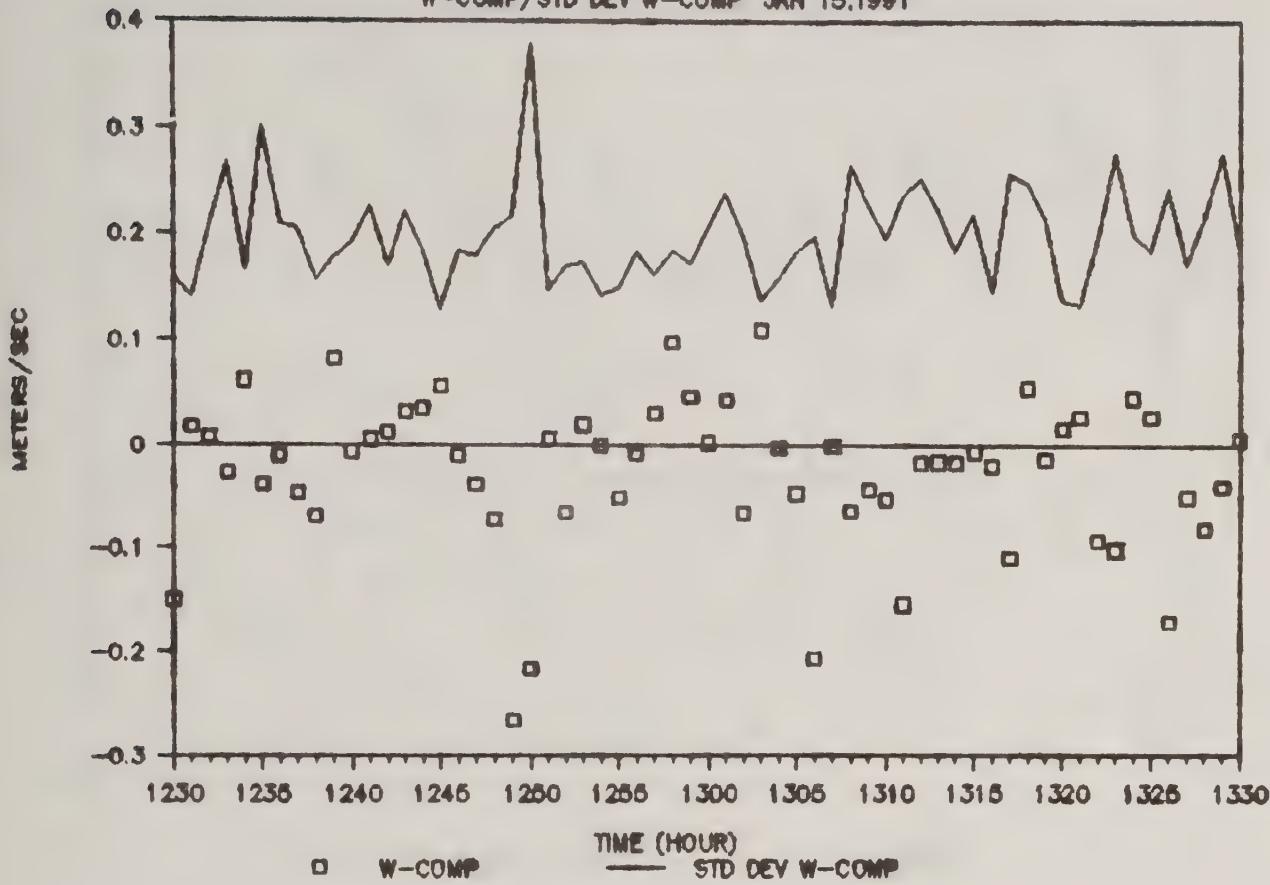
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 15.1991



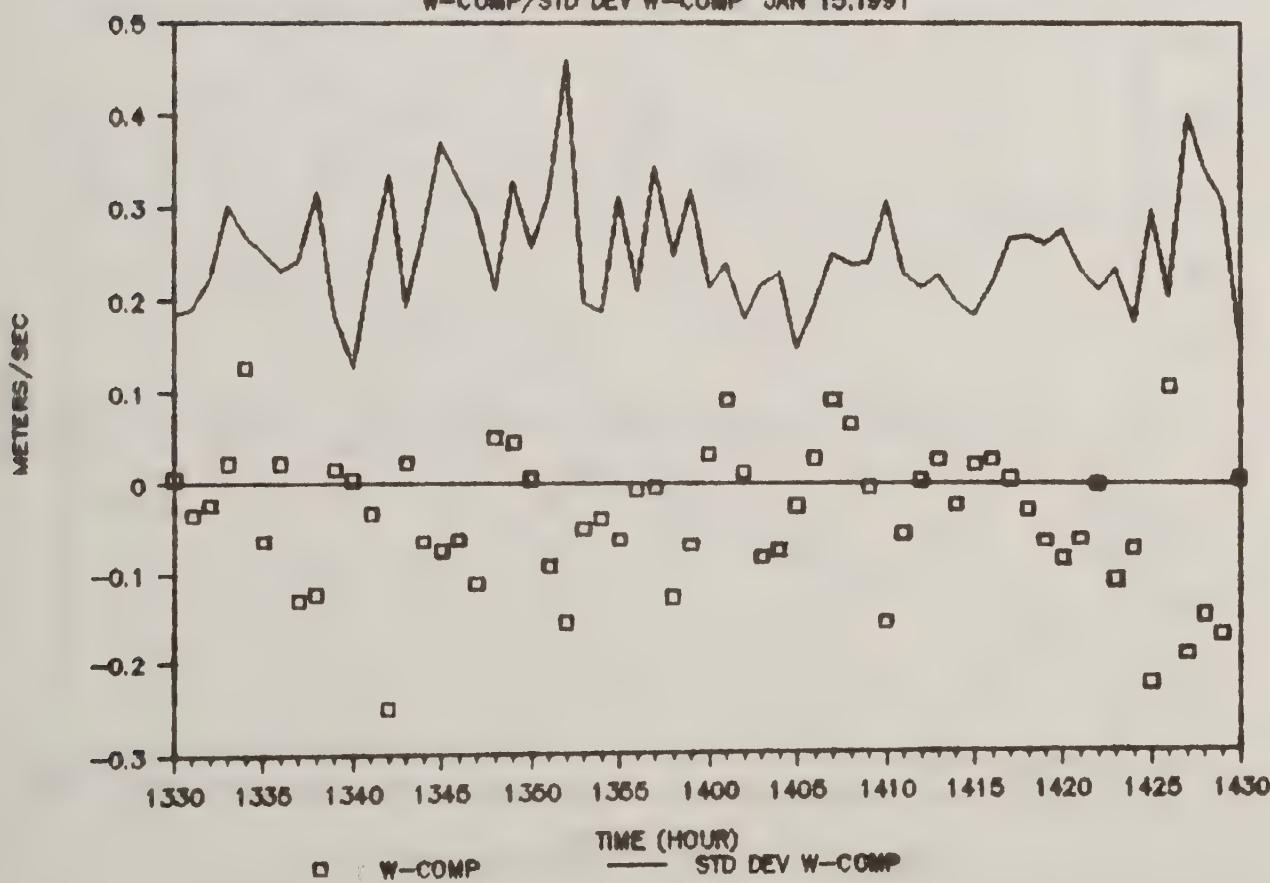
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 15,1991



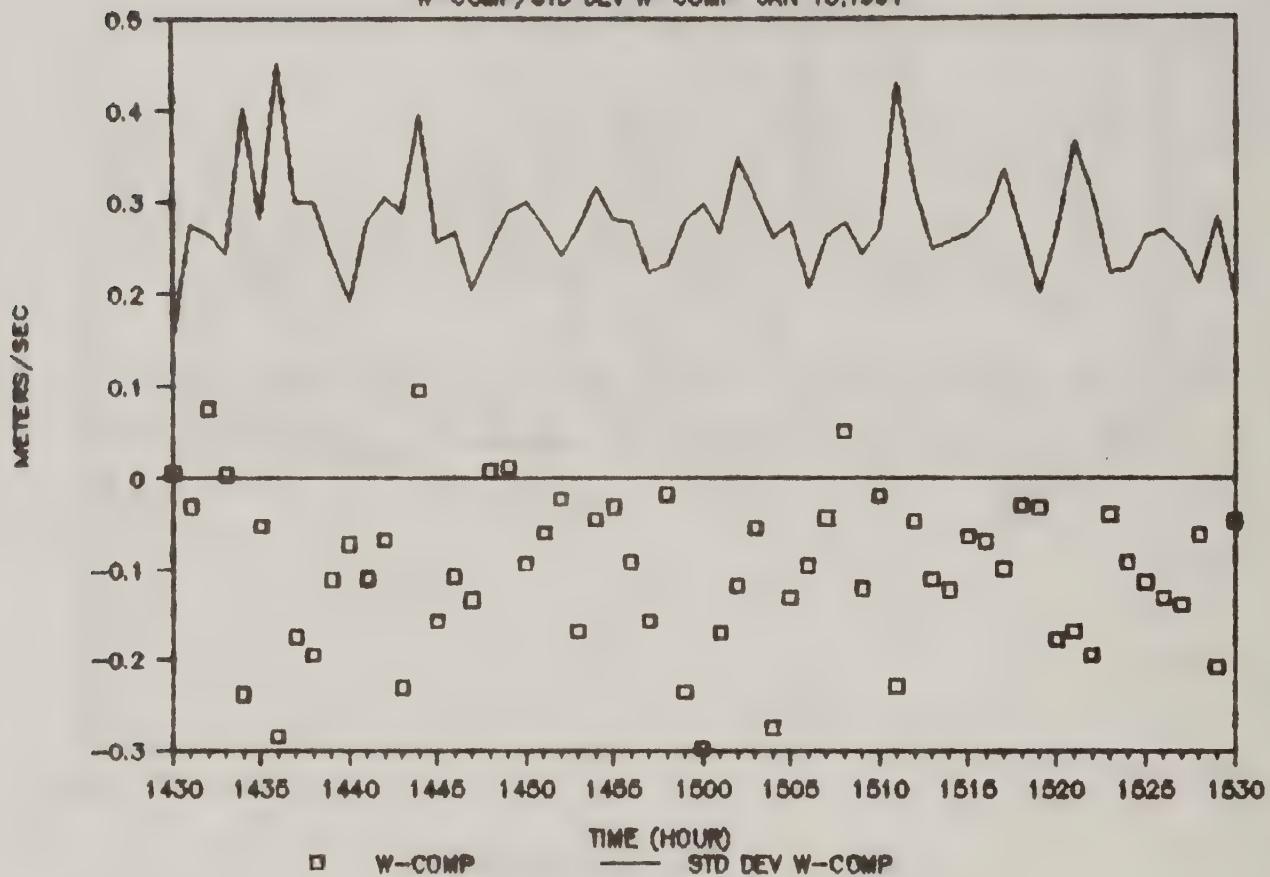
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 15,1991



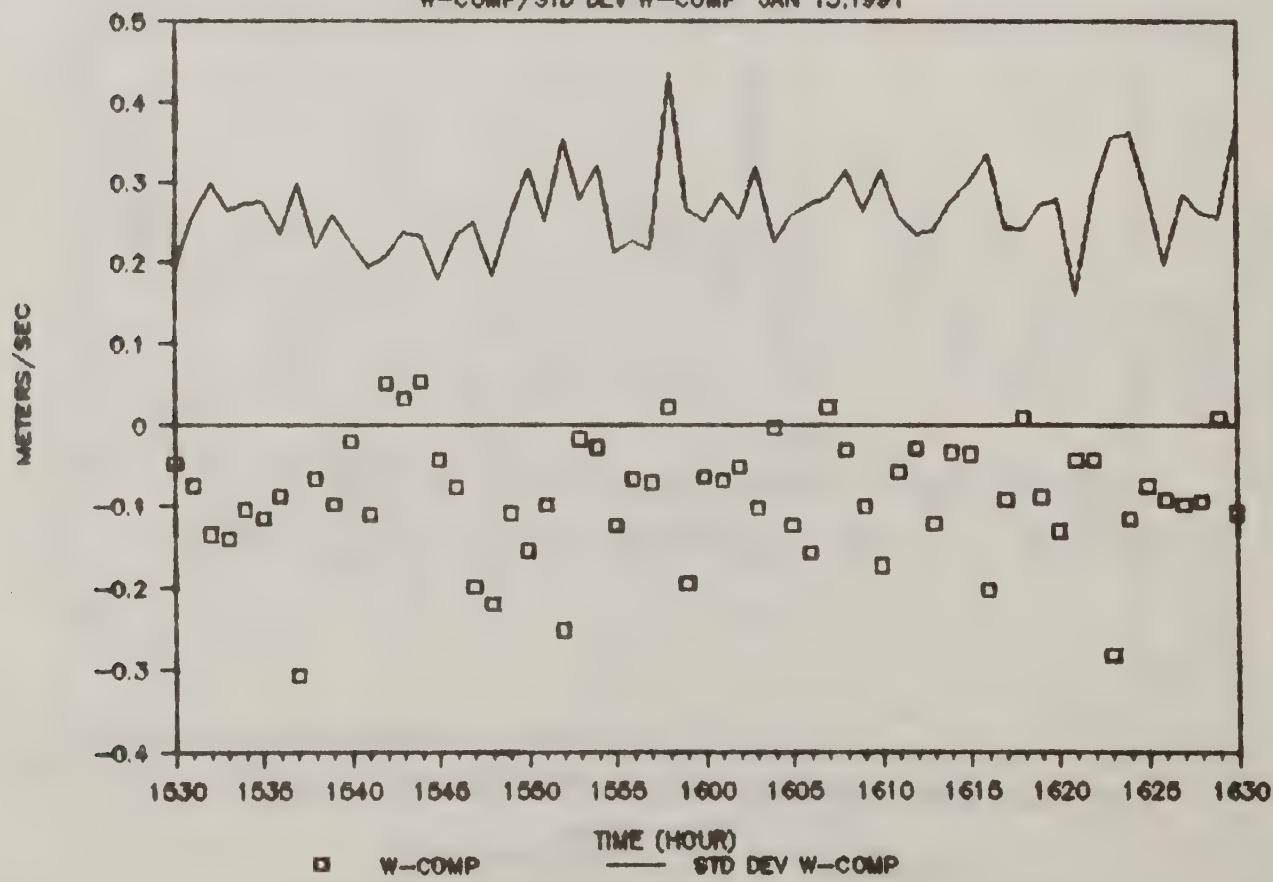
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 15,1991



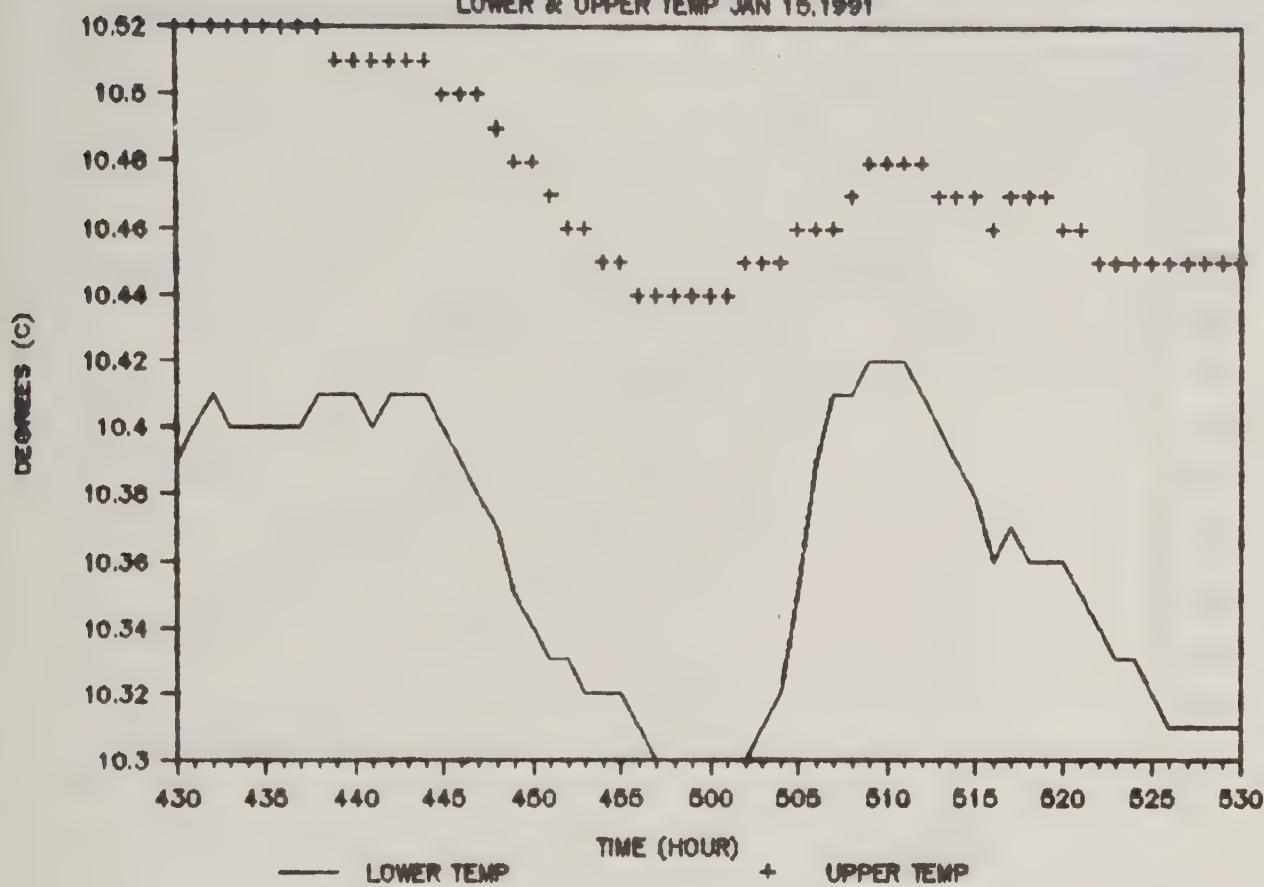
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 15,1991



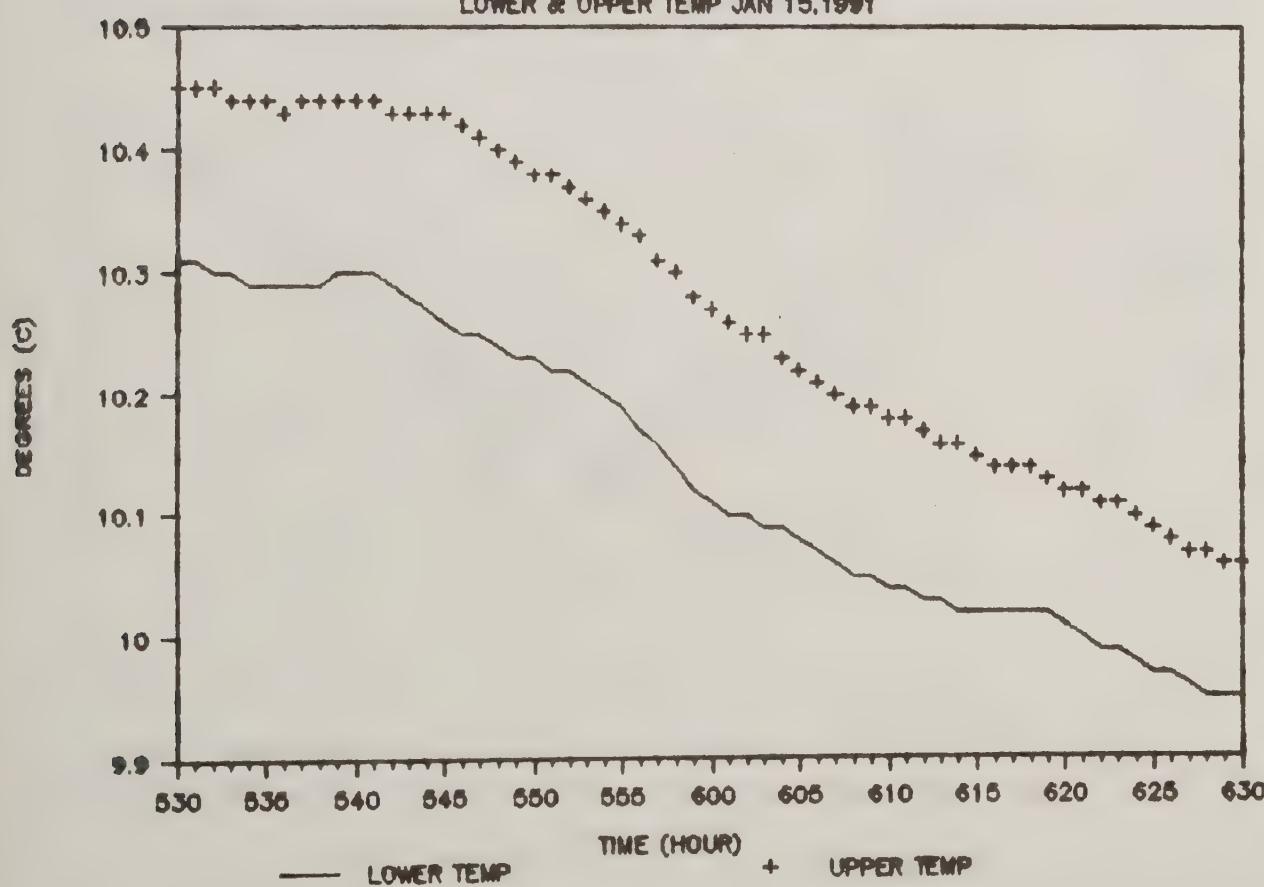
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15, 1991



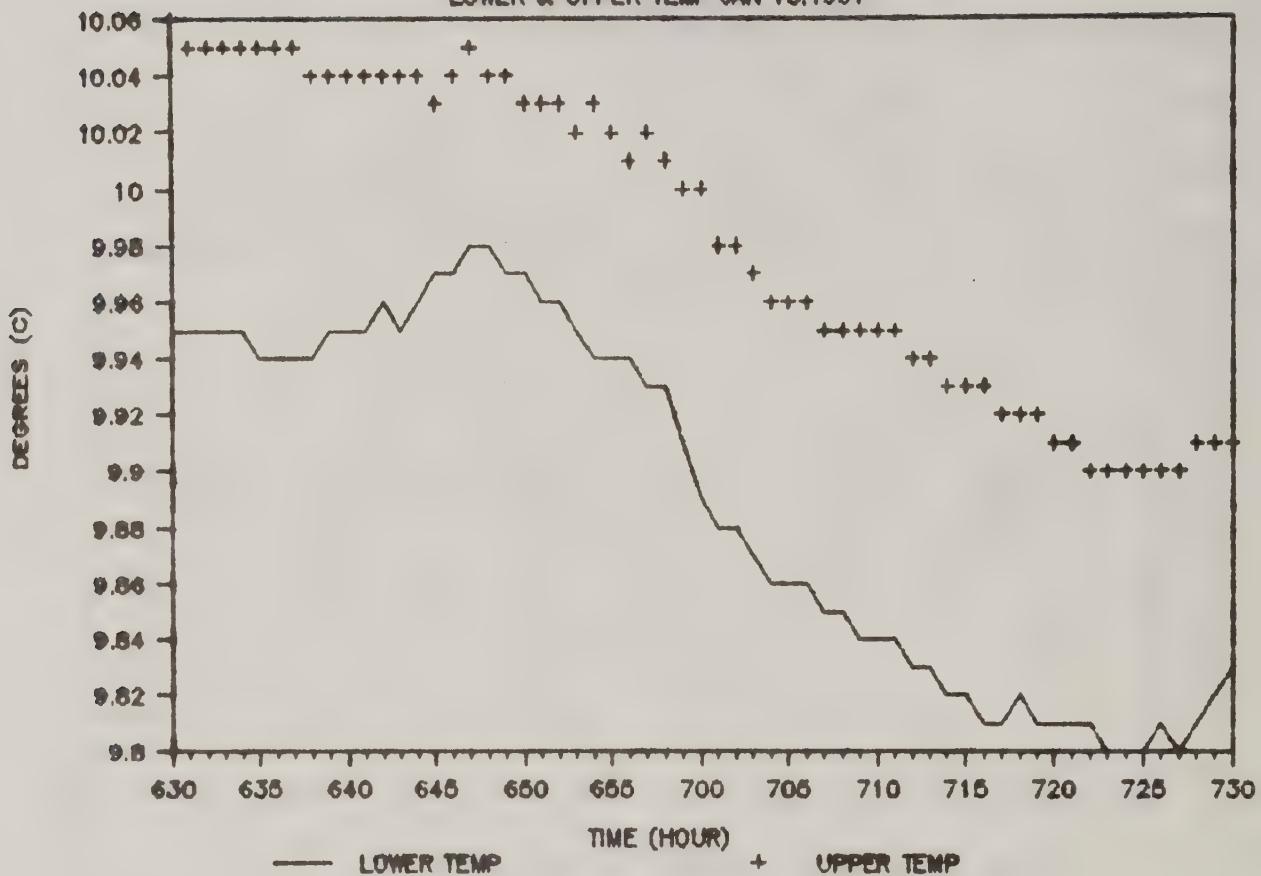
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15, 1991



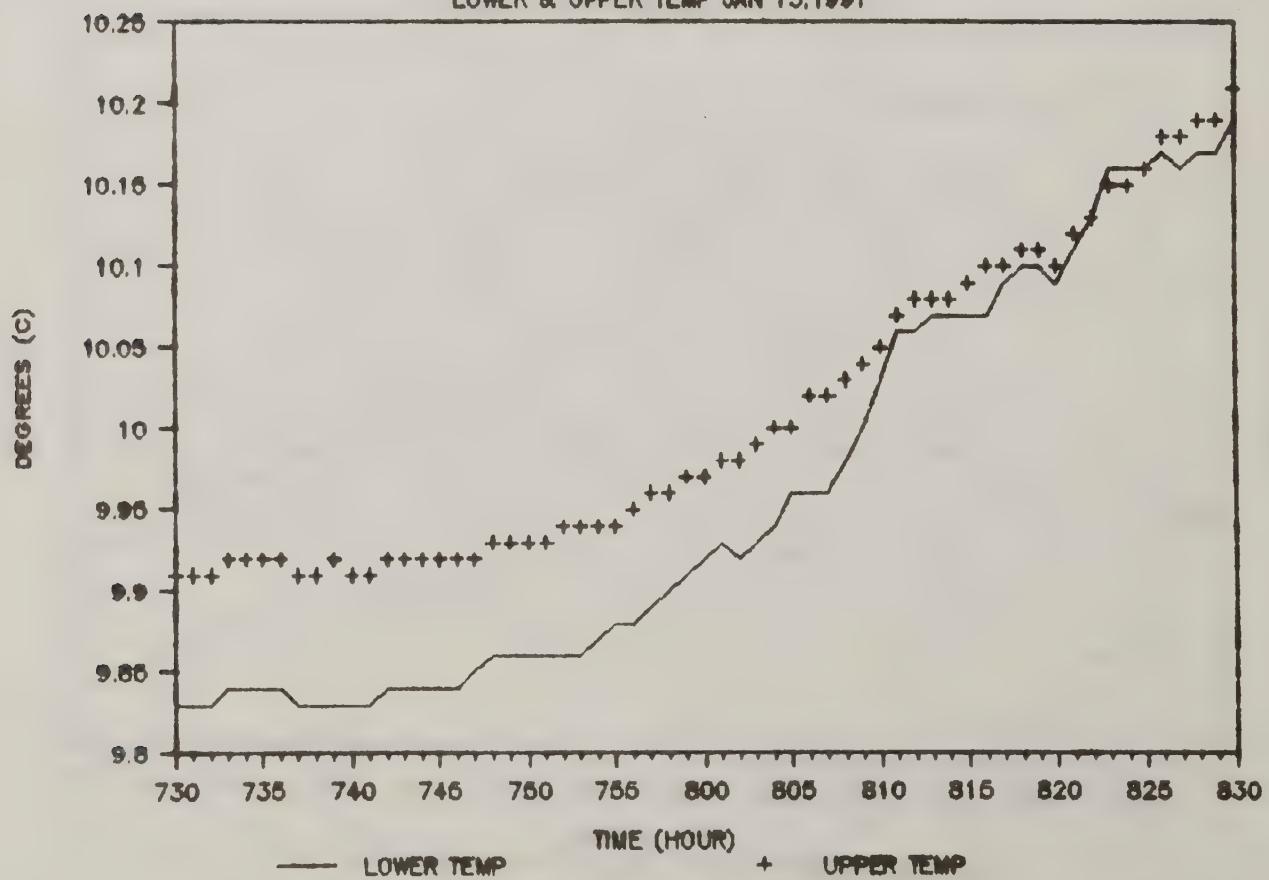
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15.1991



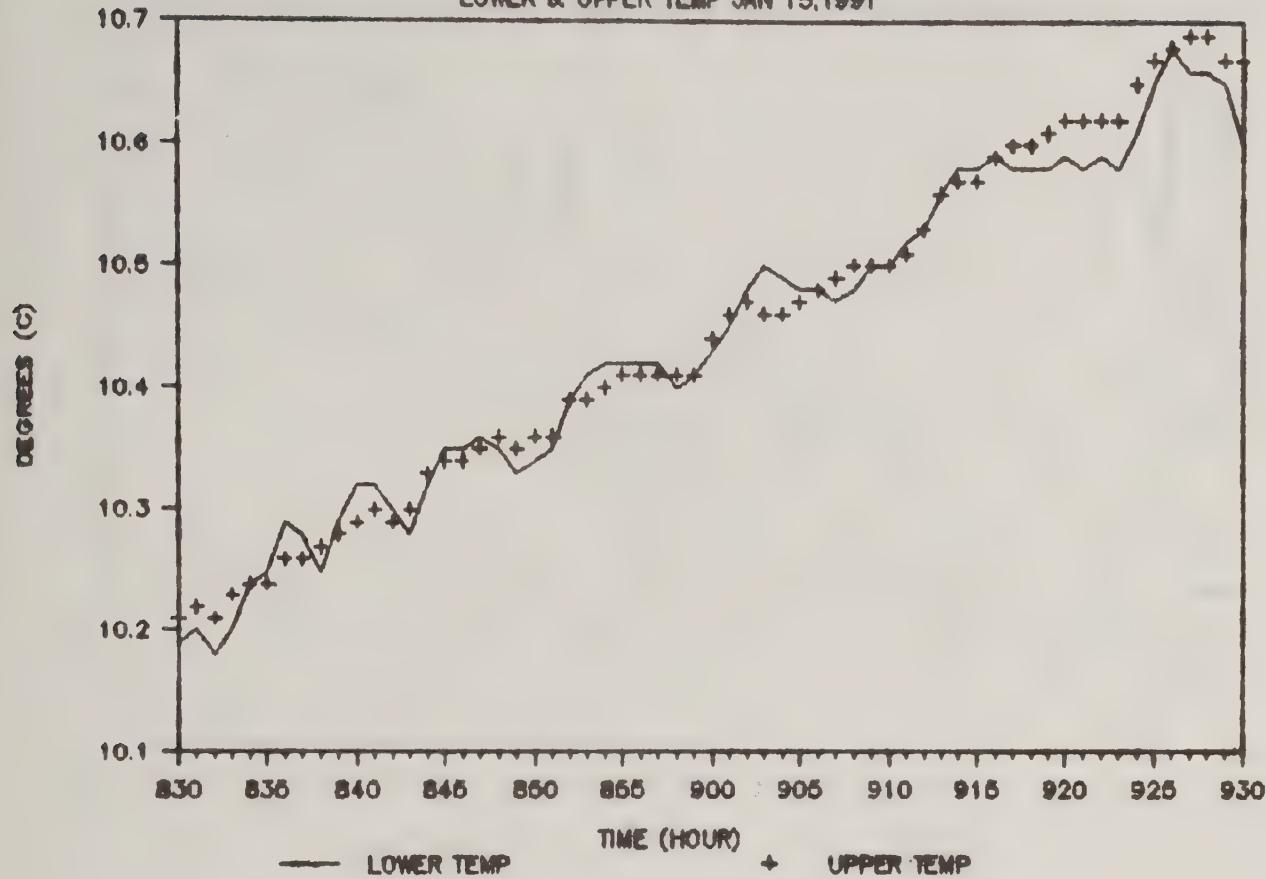
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15.1991



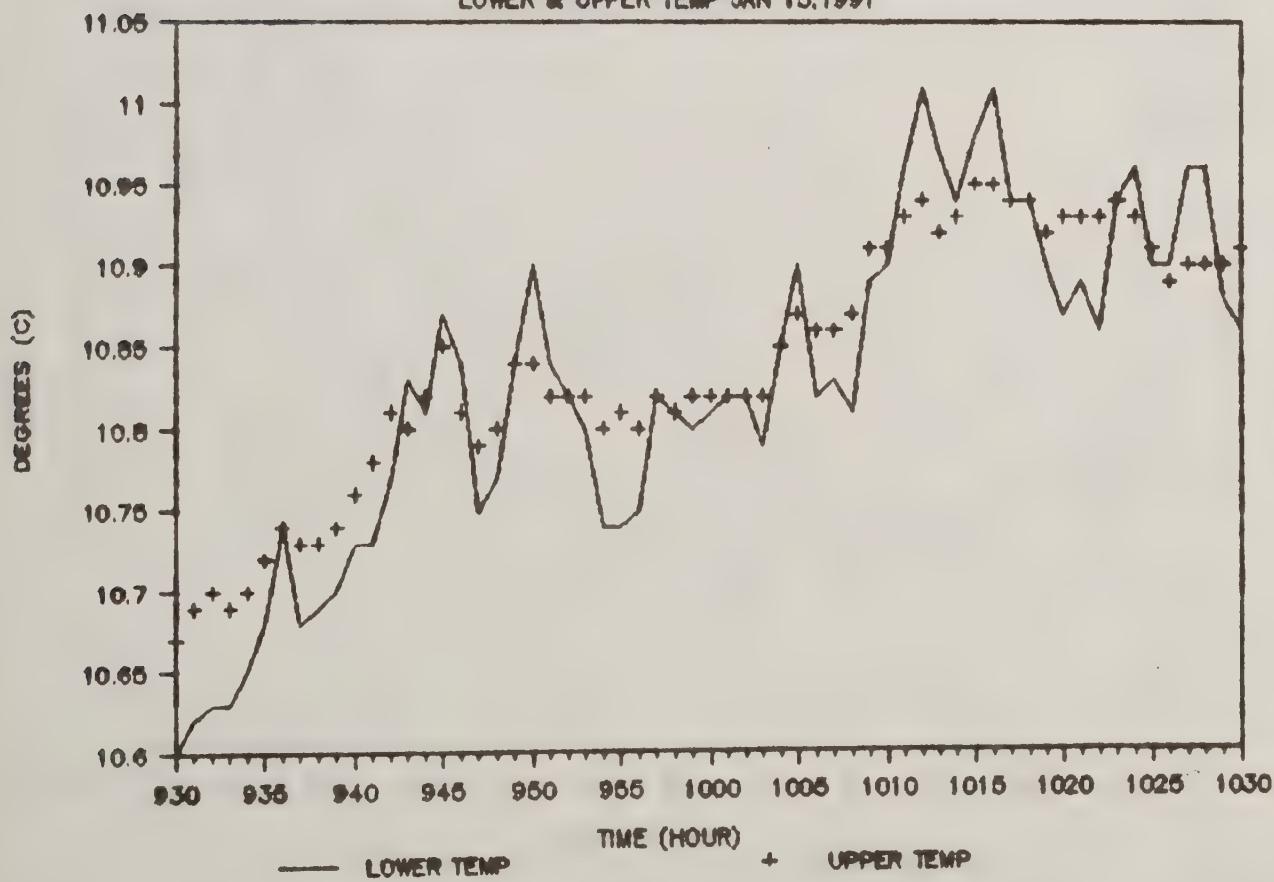
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15, 1991



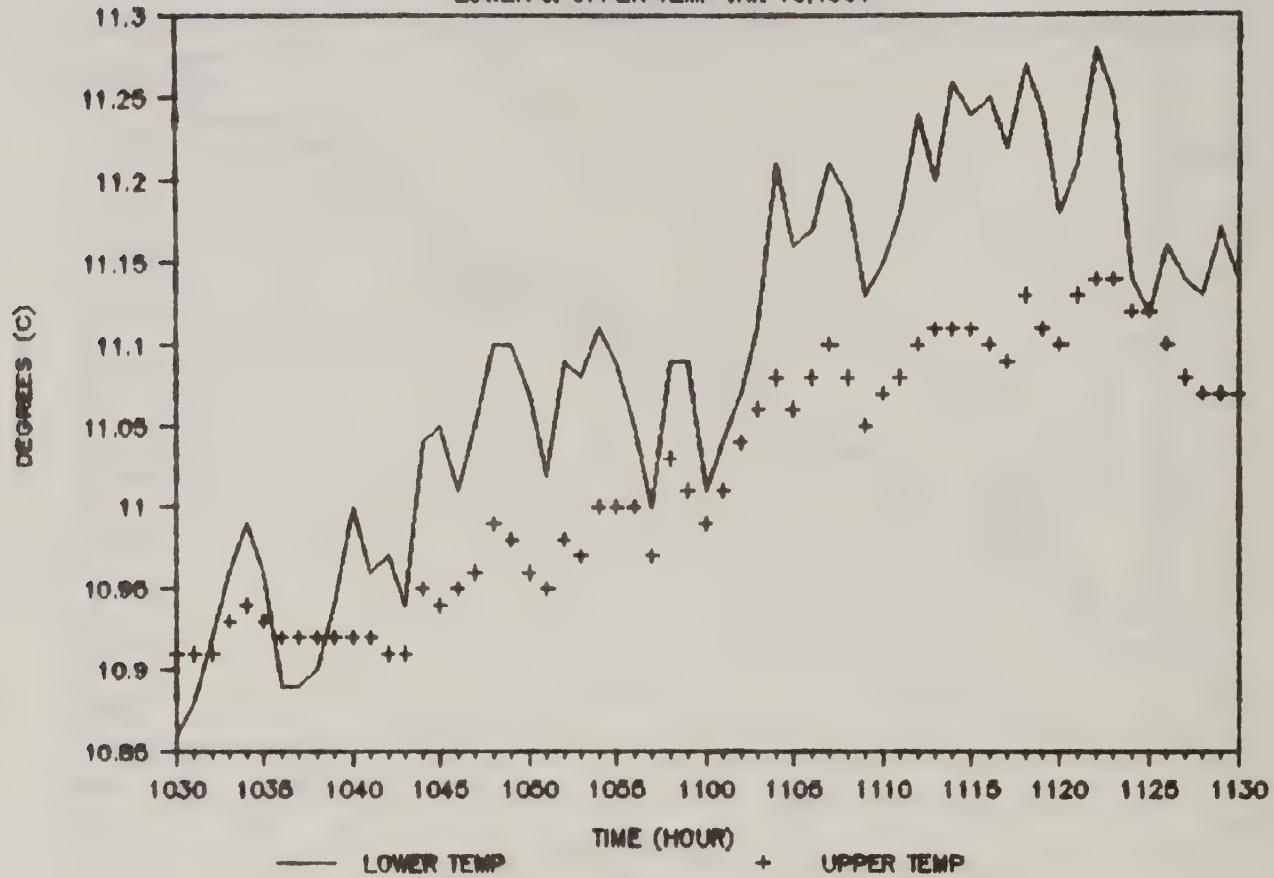
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15, 1991



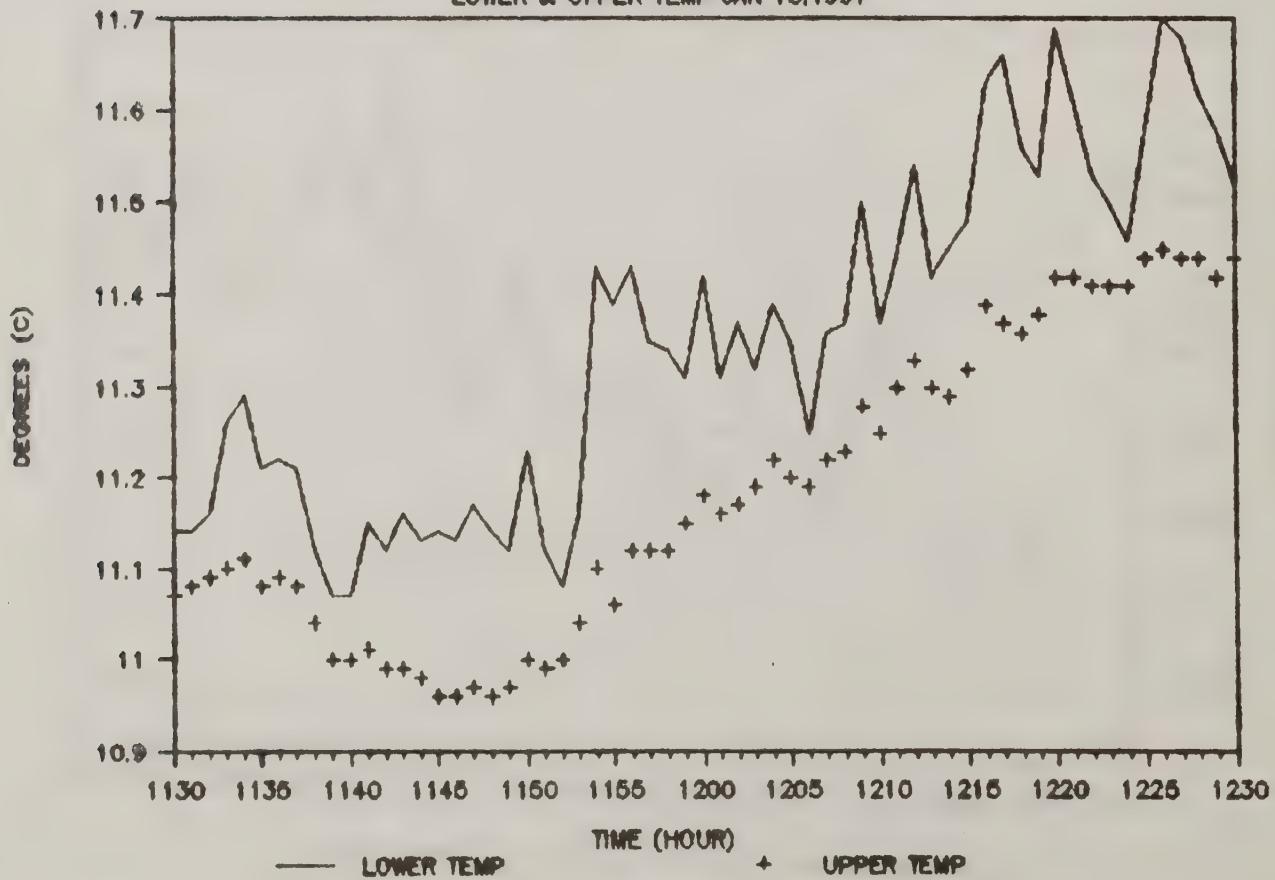
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15, 1991



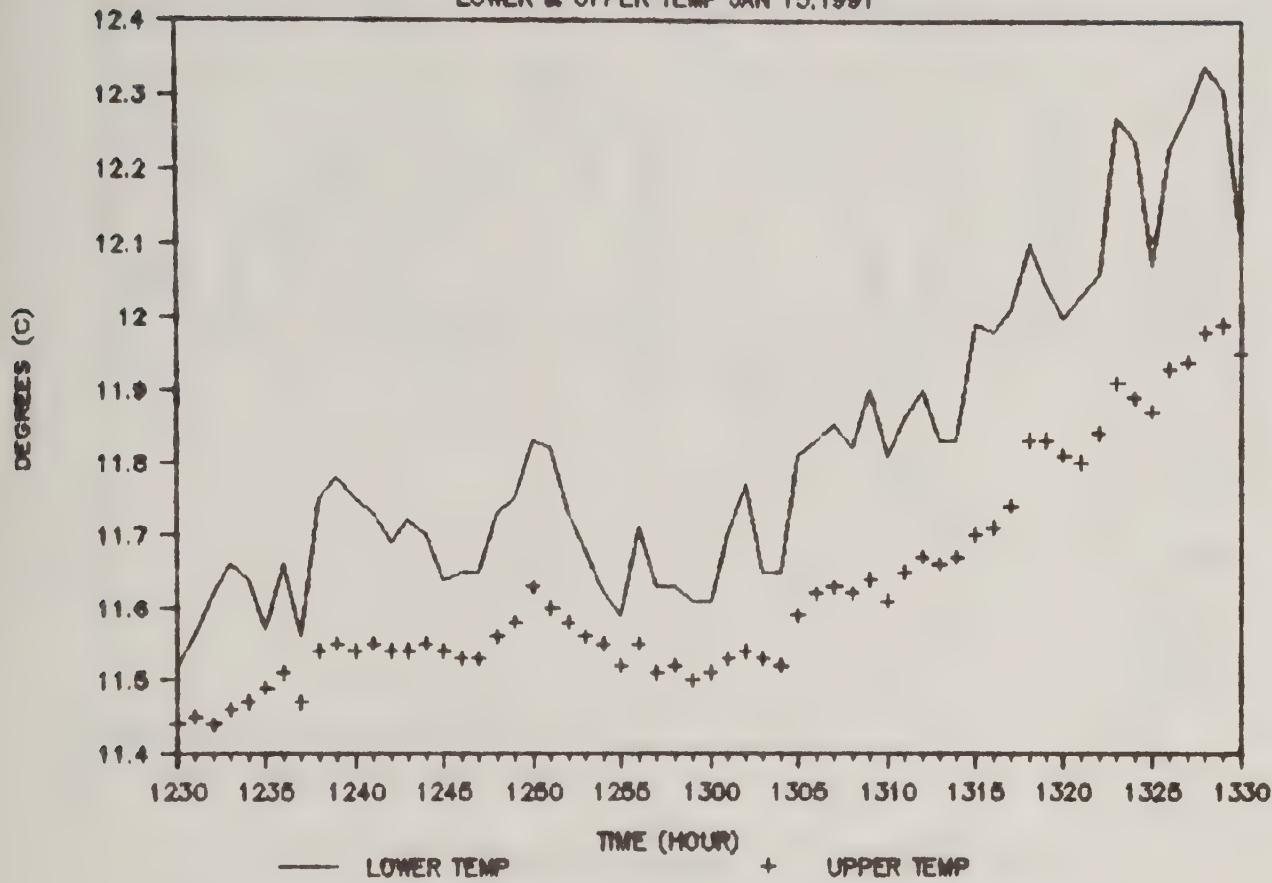
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15, 1991



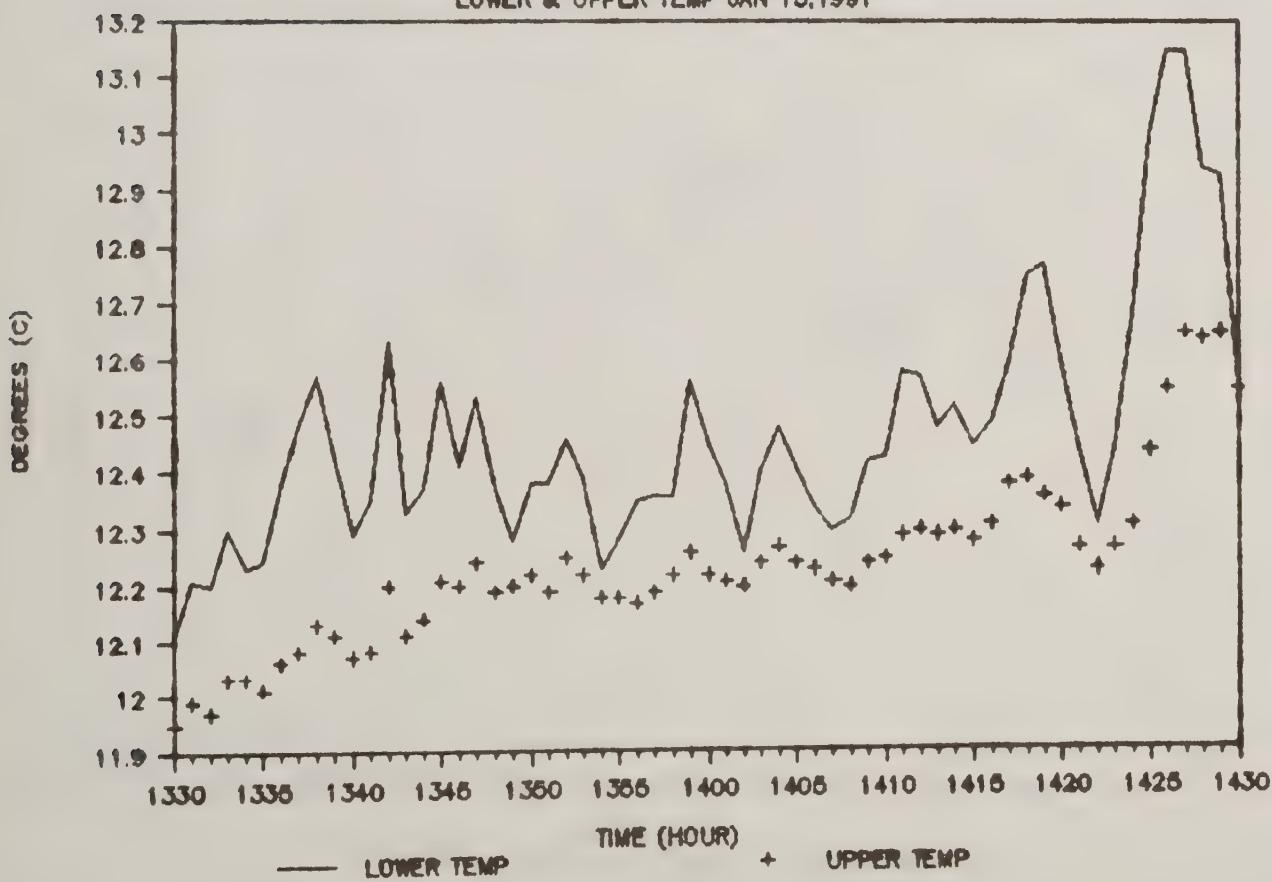
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15, 1991



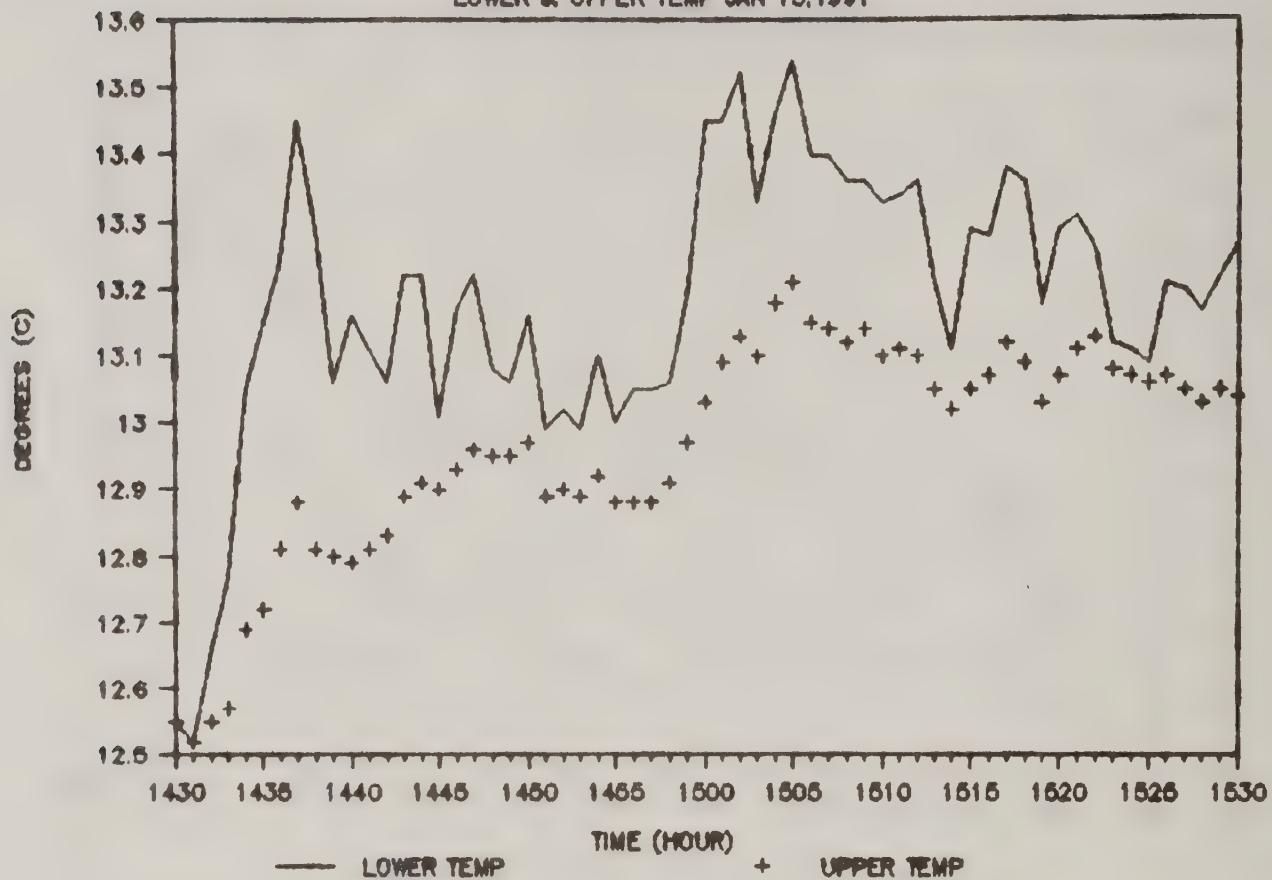
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15, 1991



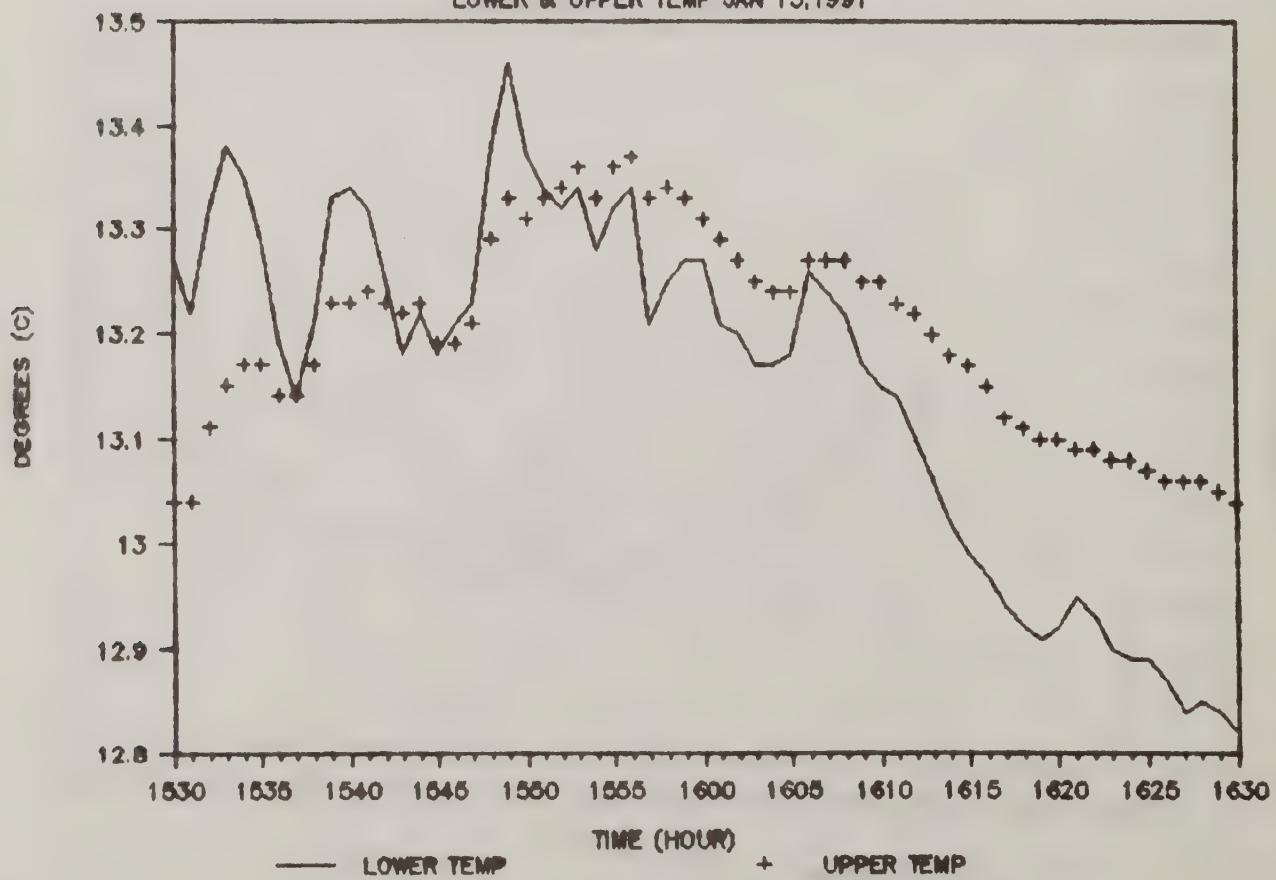
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15, 1991

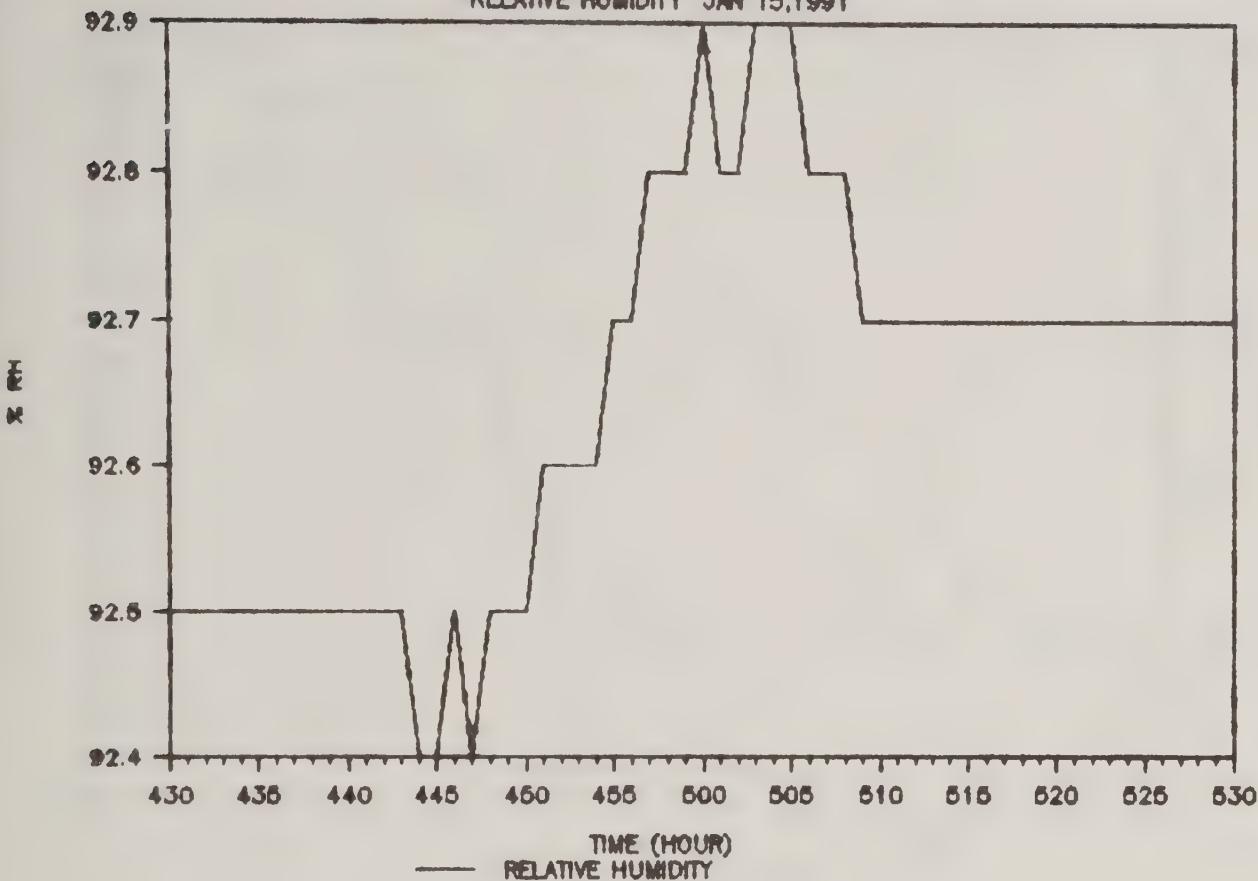


DAVIS WEATHER DATA STN #2

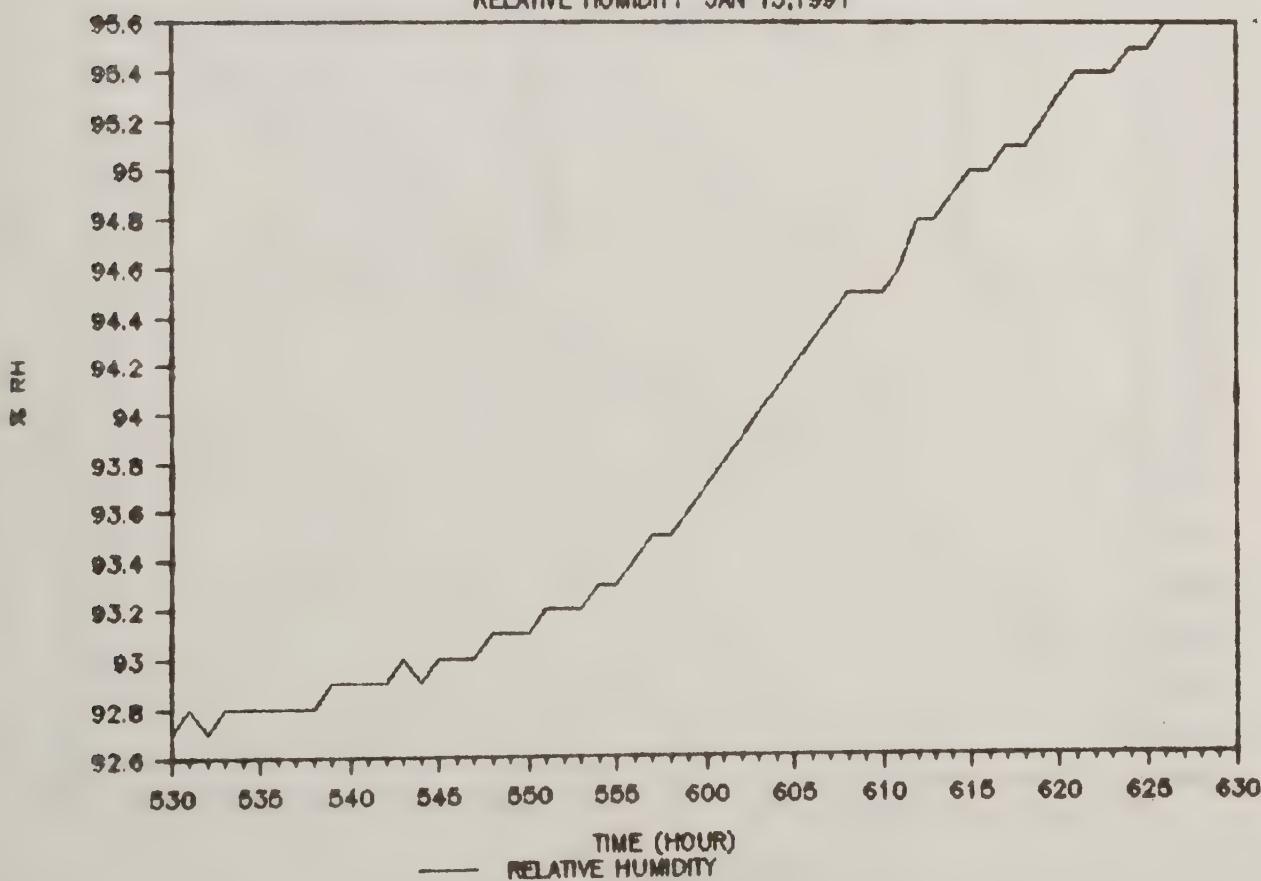
LOWER & UPPER TEMP JAN 15, 1991



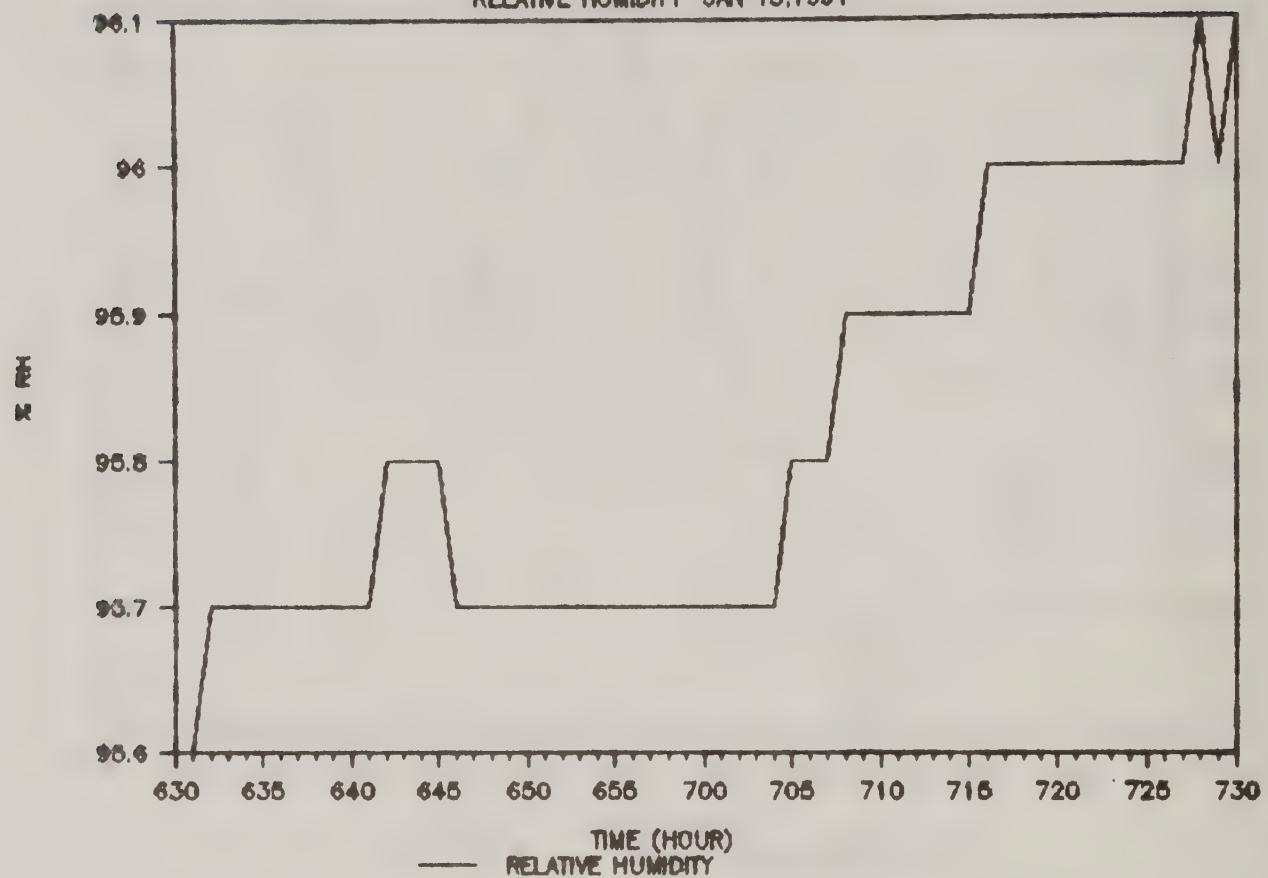
DAVIS WEATHER DATA STN #2
RELATIVE HUMIDITY JAN 15,1991



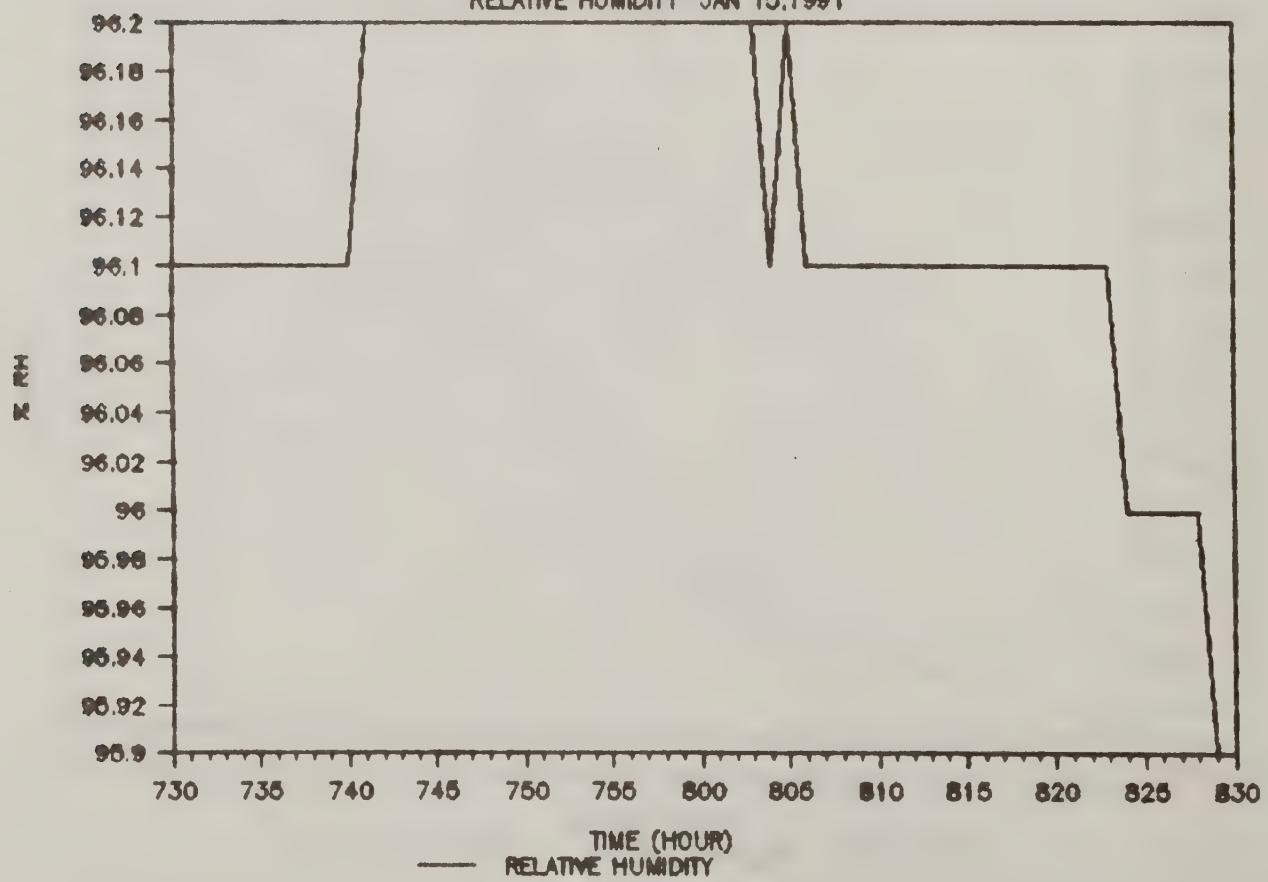
DAVIS WEATHER DATA STN #2
RELATIVE HUMIDITY JAN 15,1991



DAVIS WEATHER DATA STN #2
RELATIVE HUMIDITY JAN 15,1991



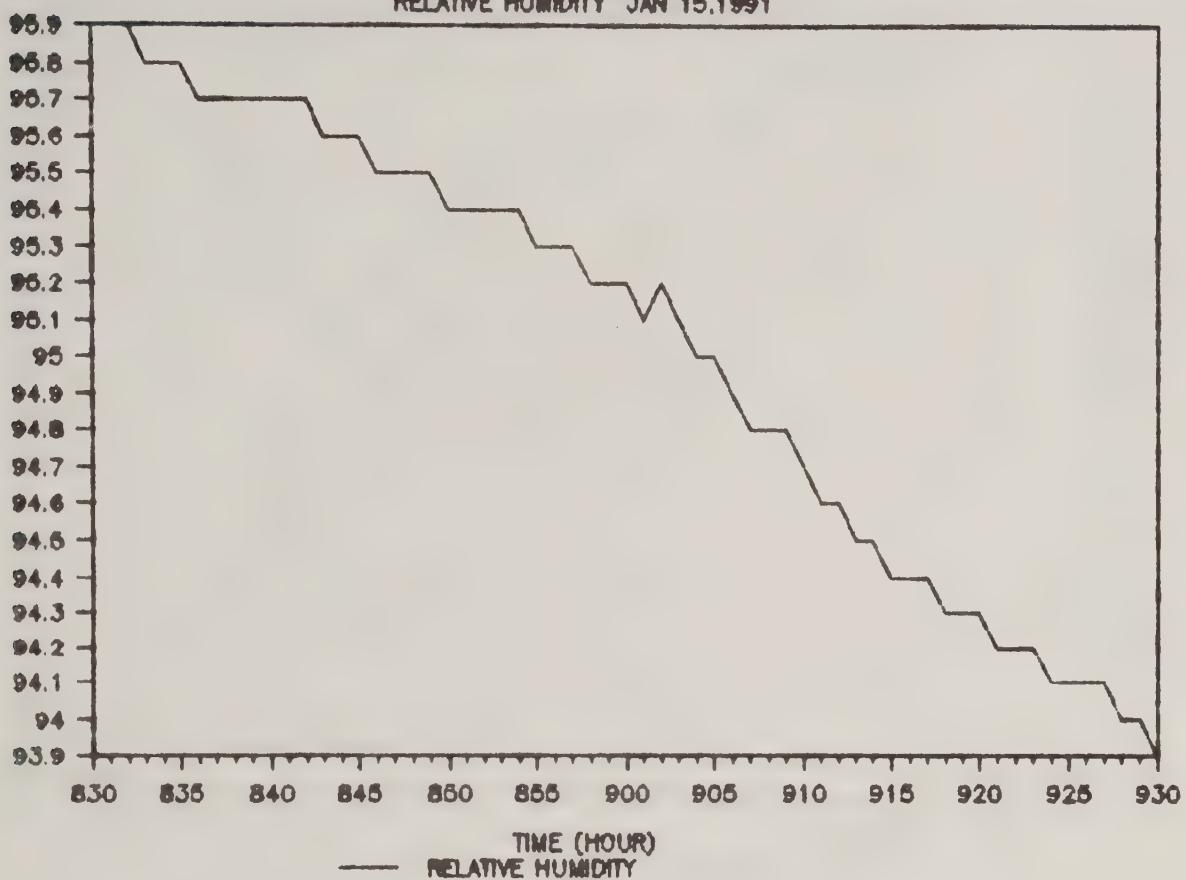
DAVIS WEATHER DATA STN #2
RELATIVE HUMIDITY JAN 15,1991



DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 15.1991

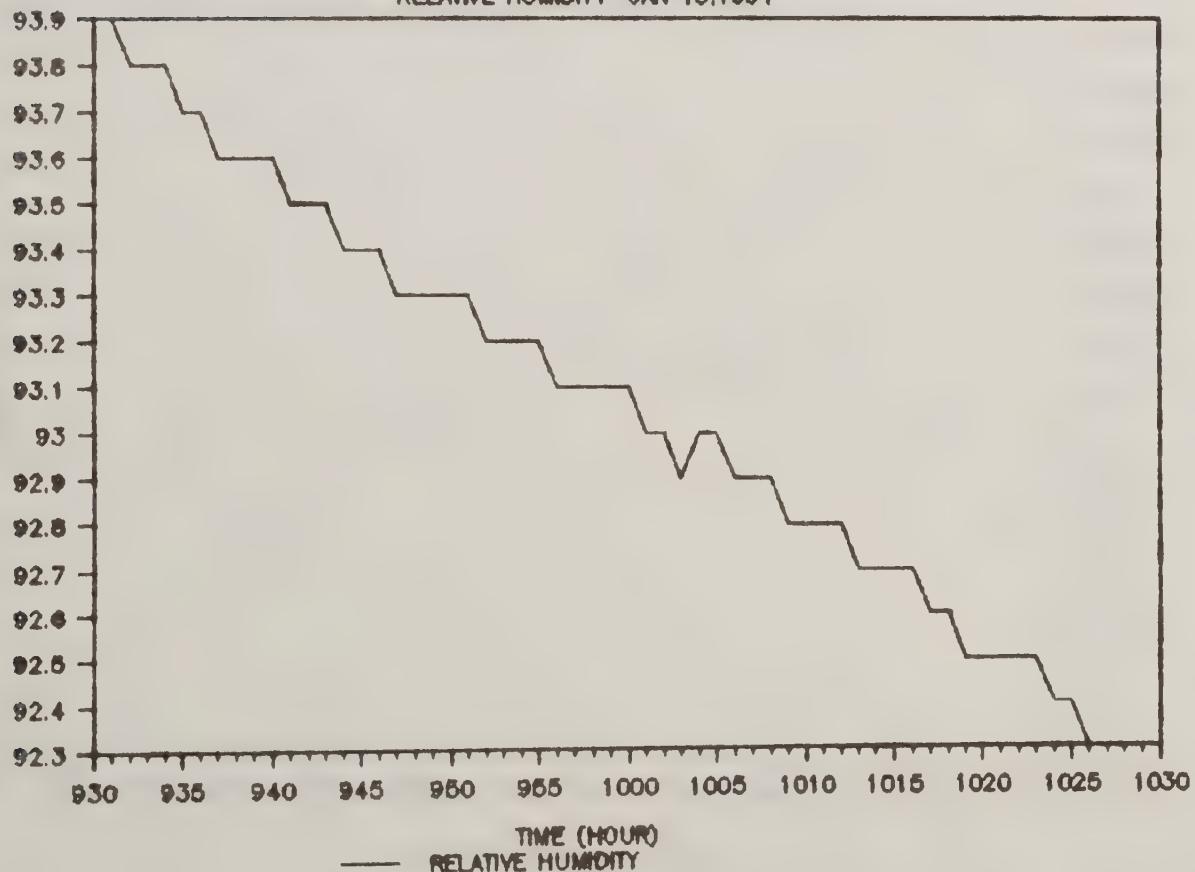
REK



DAVIS WEATHER DATA STN #2

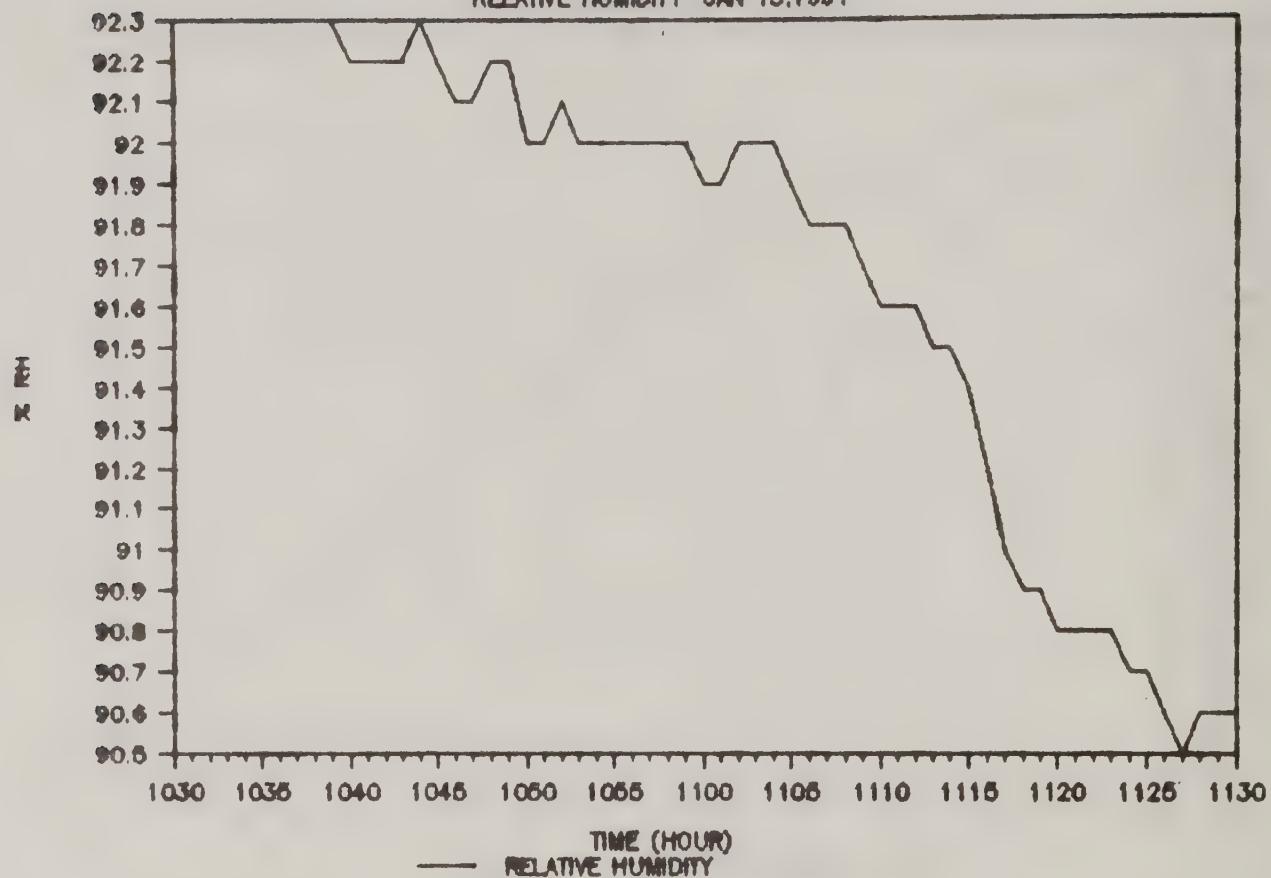
RELATIVE HUMIDITY JAN 15.1991

REK



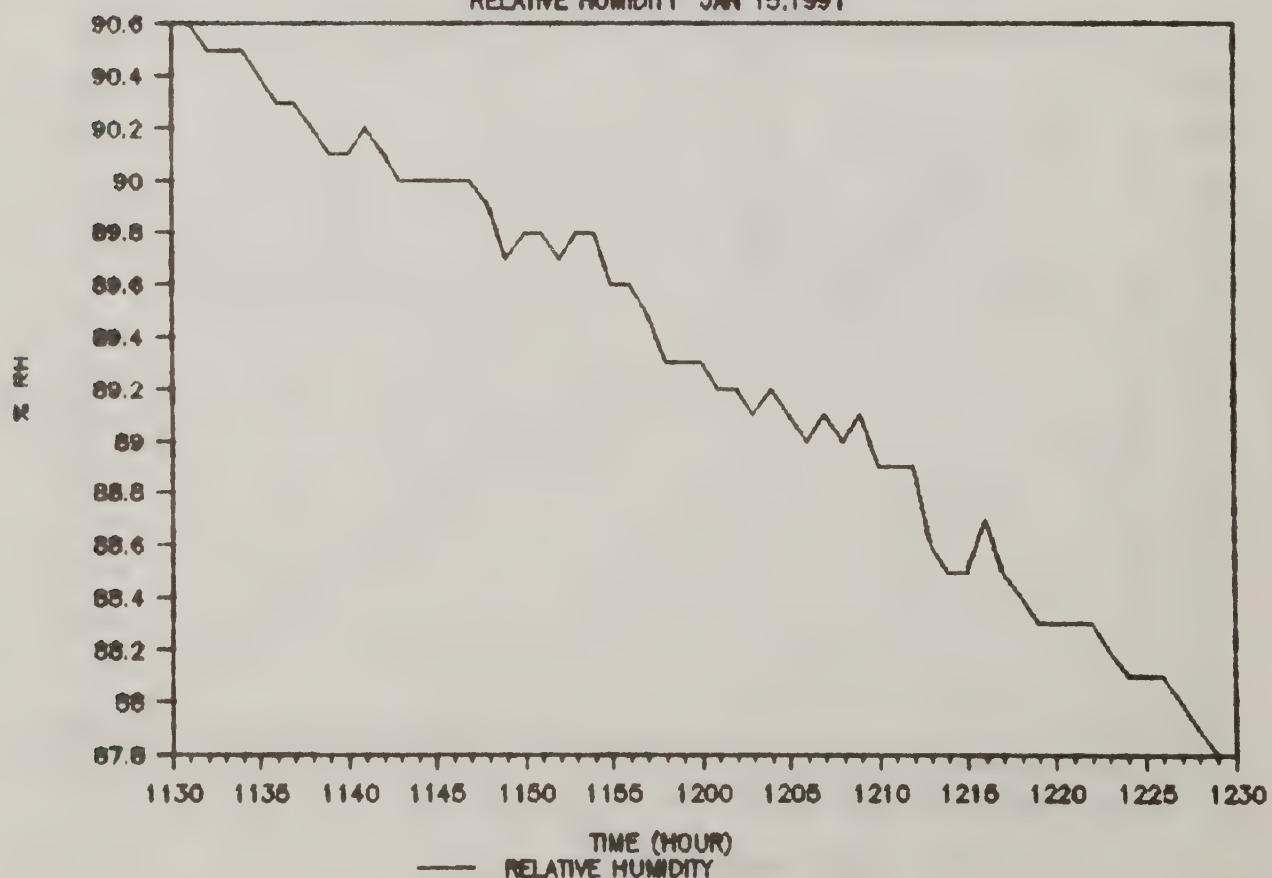
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 15, 1991



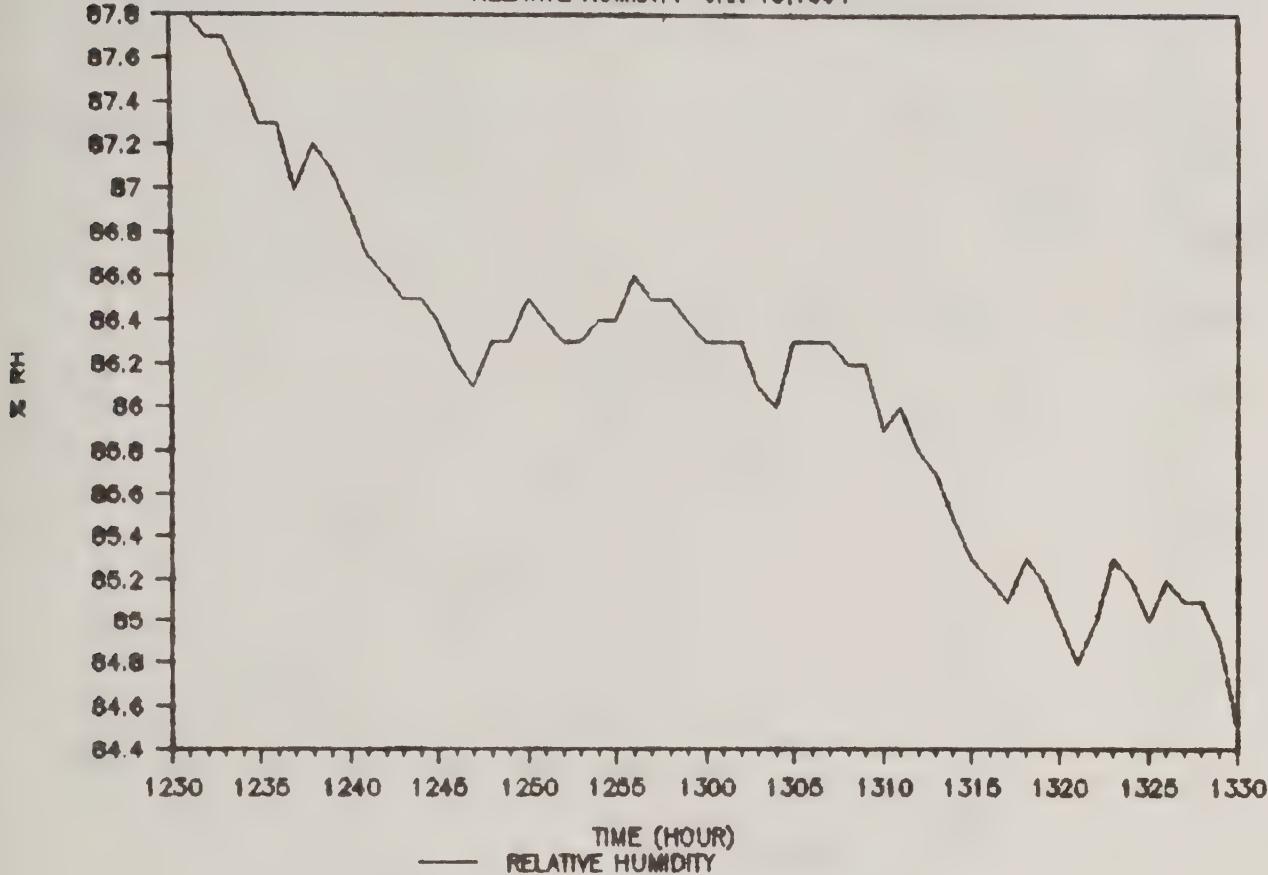
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 15, 1991



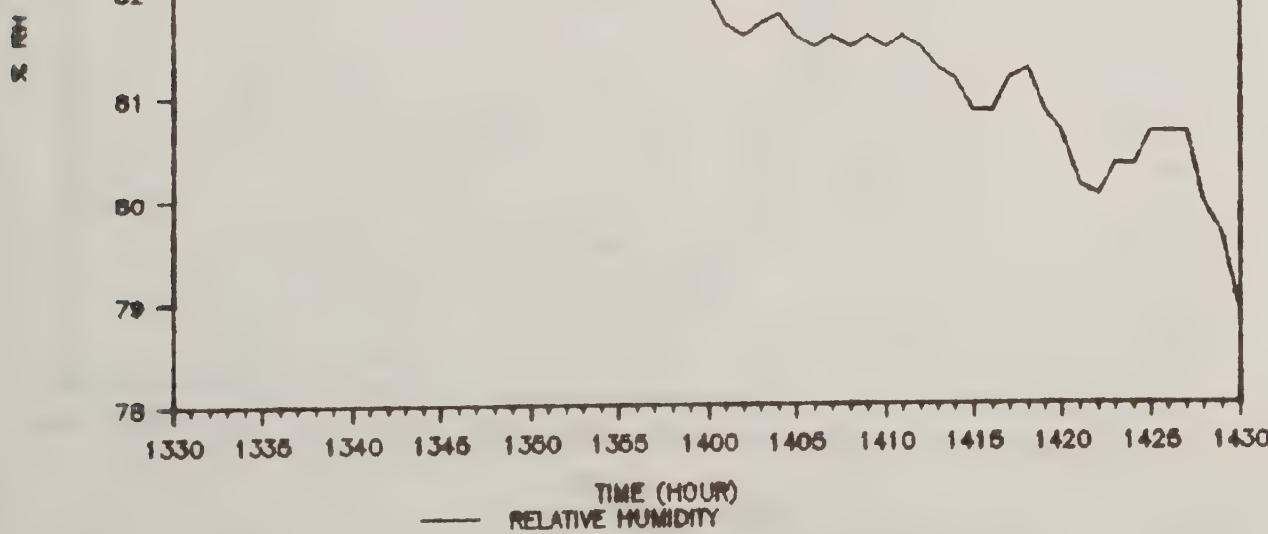
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 15, 1991



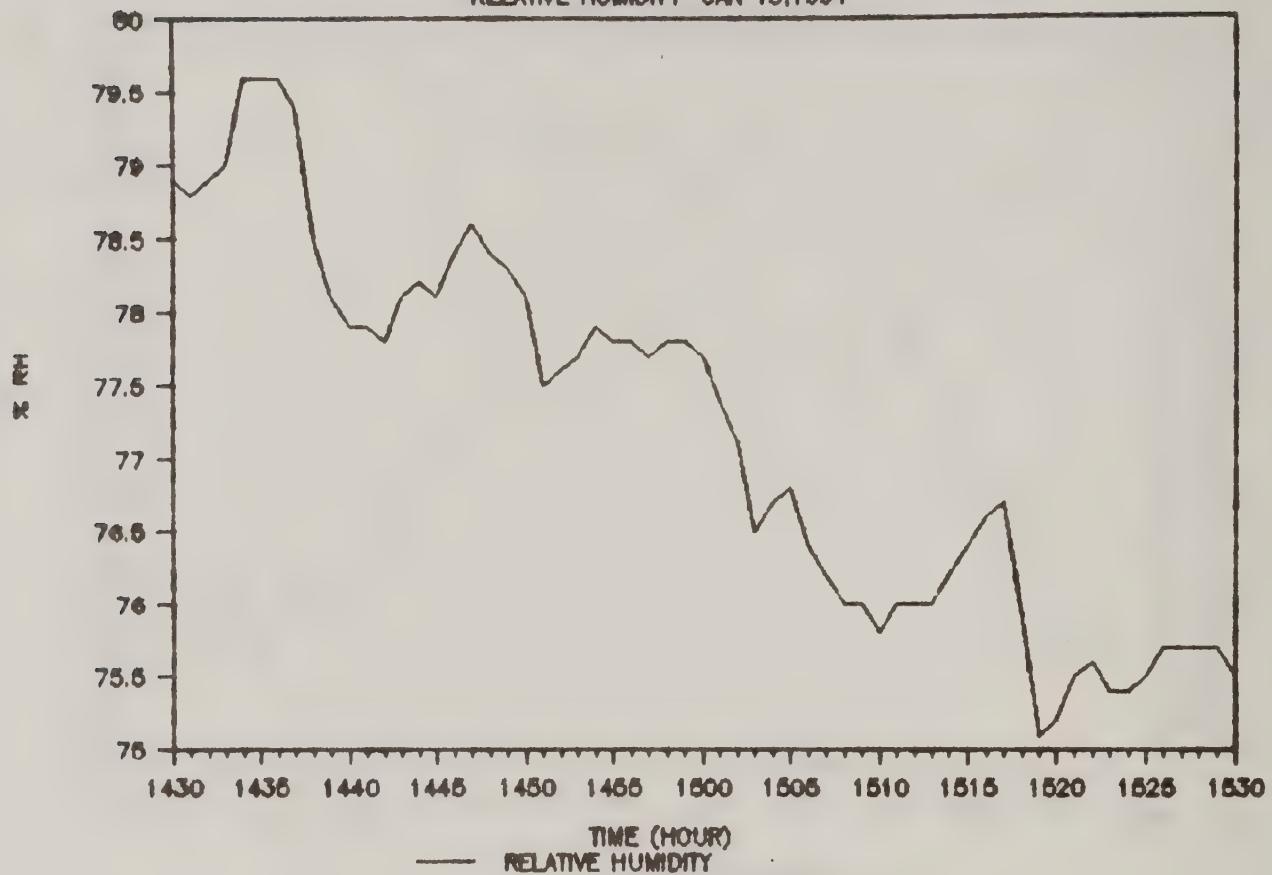
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 15, 1991



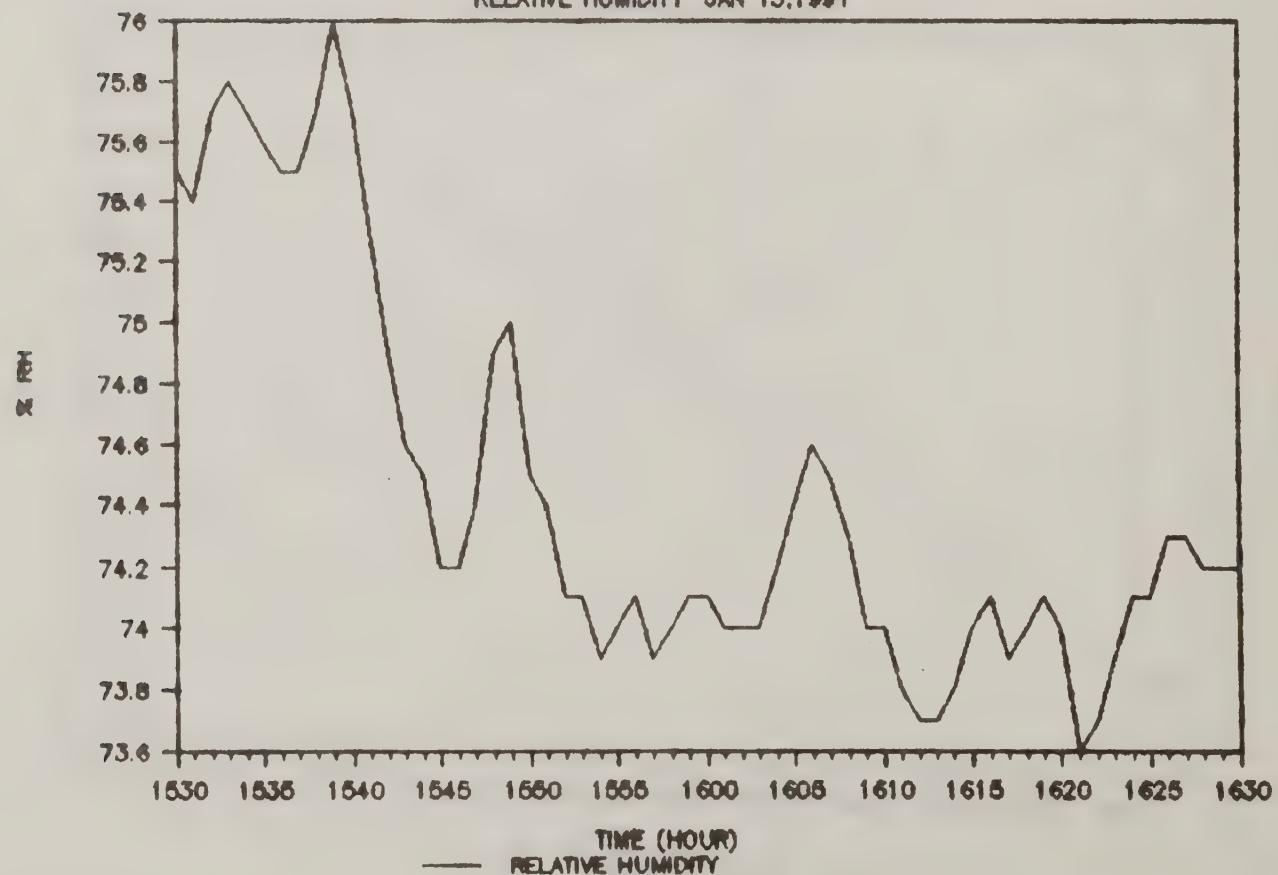
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 15, 1991



DAVIS WEATHER DATA STN #2

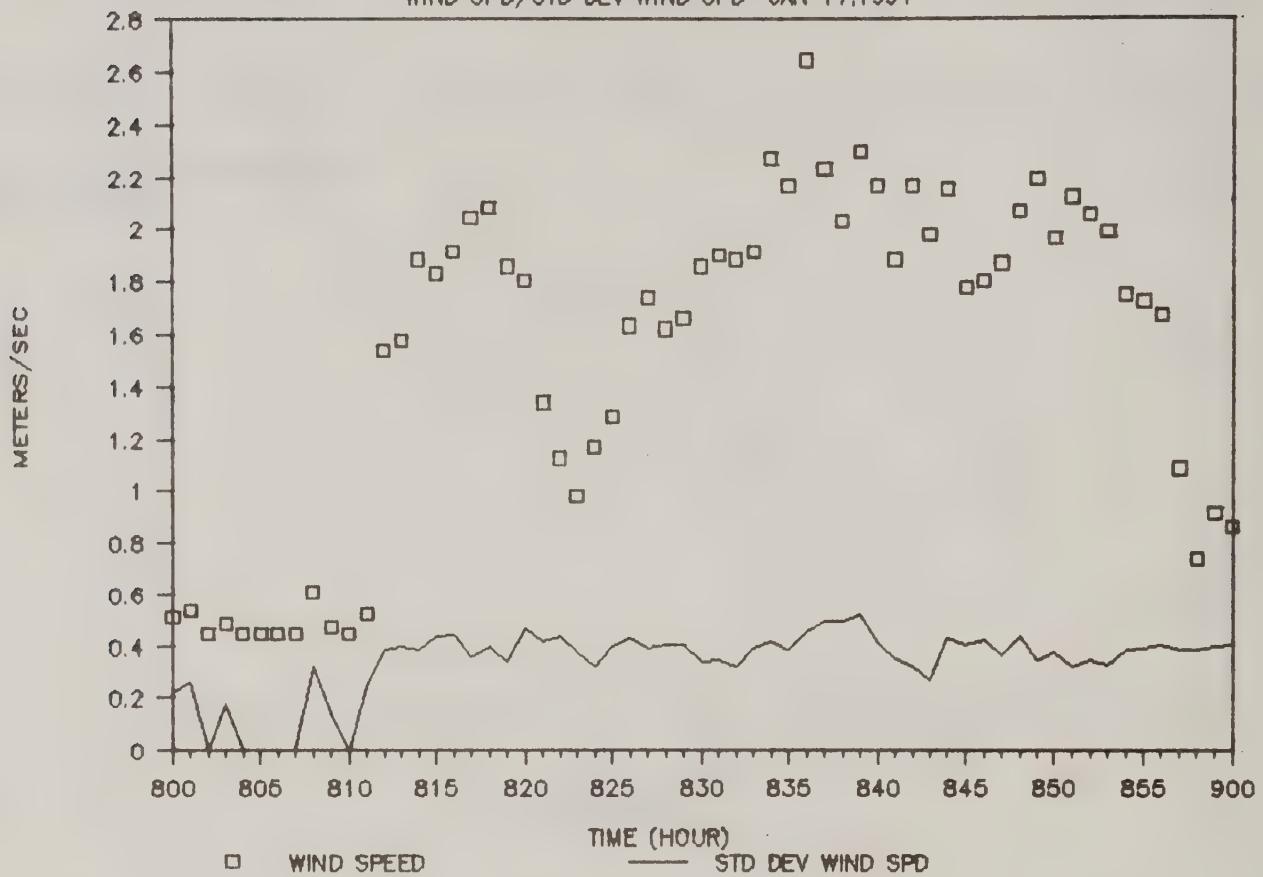
RELATIVE HUMIDITY JAN 15, 1991



Davis Weather Data Station No. 1
January 17, 1991

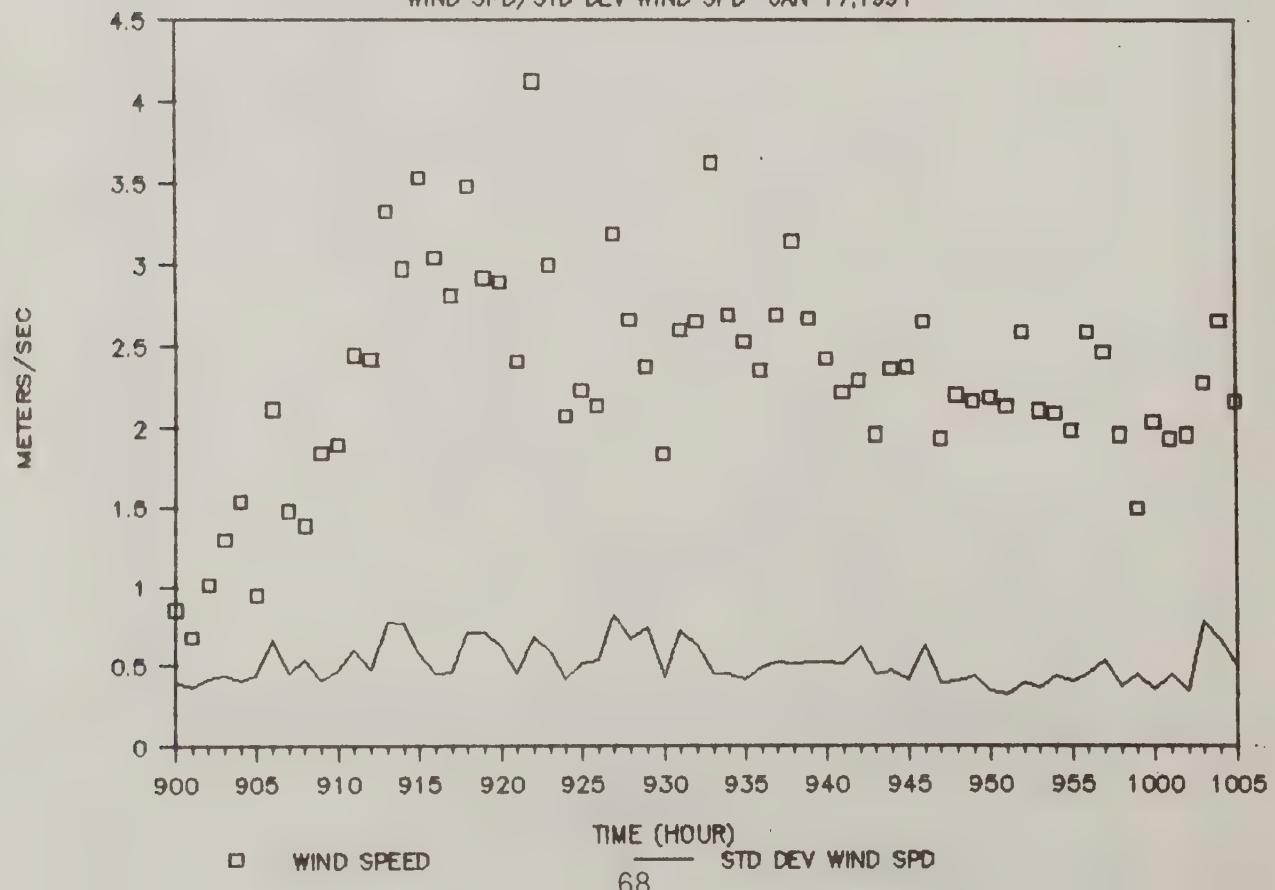
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 17,1991



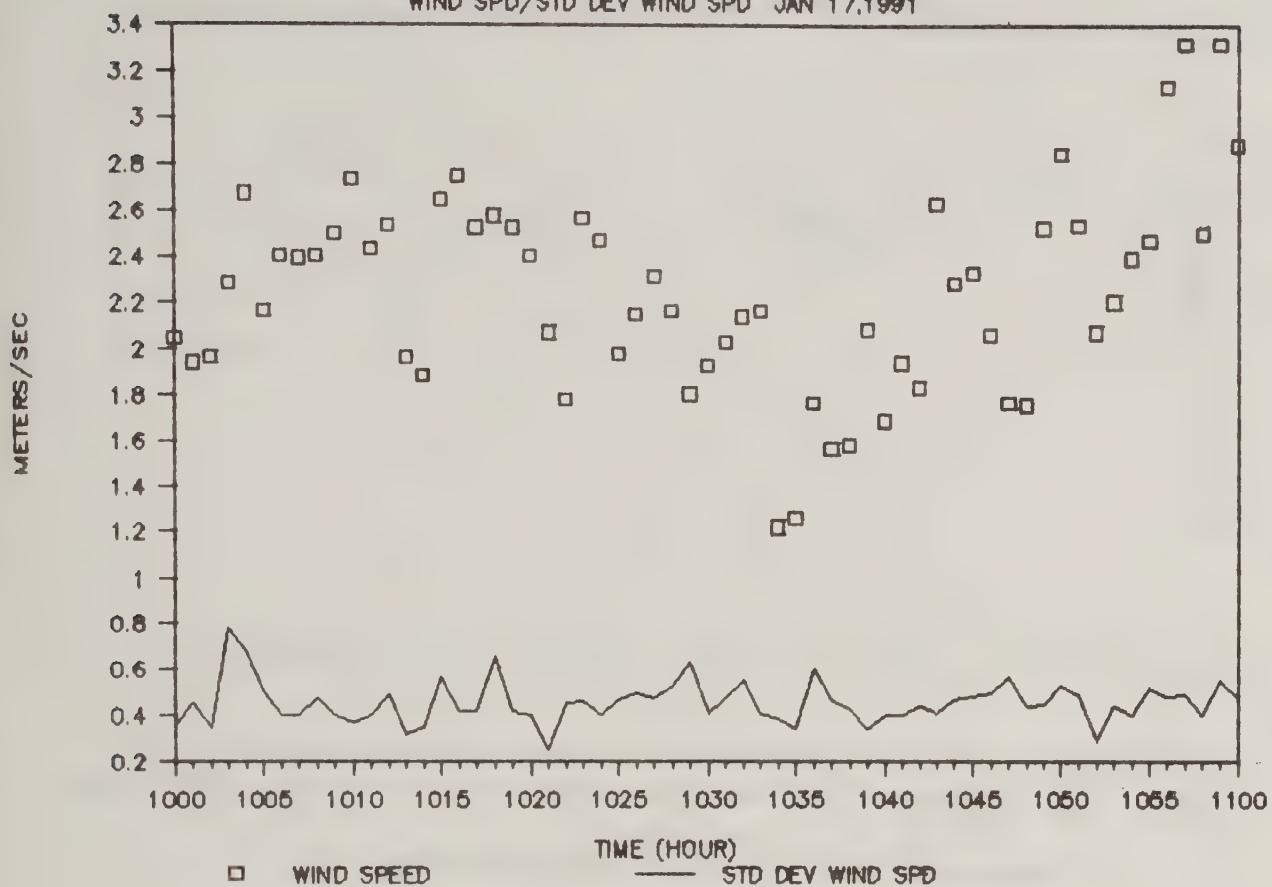
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 17,1991



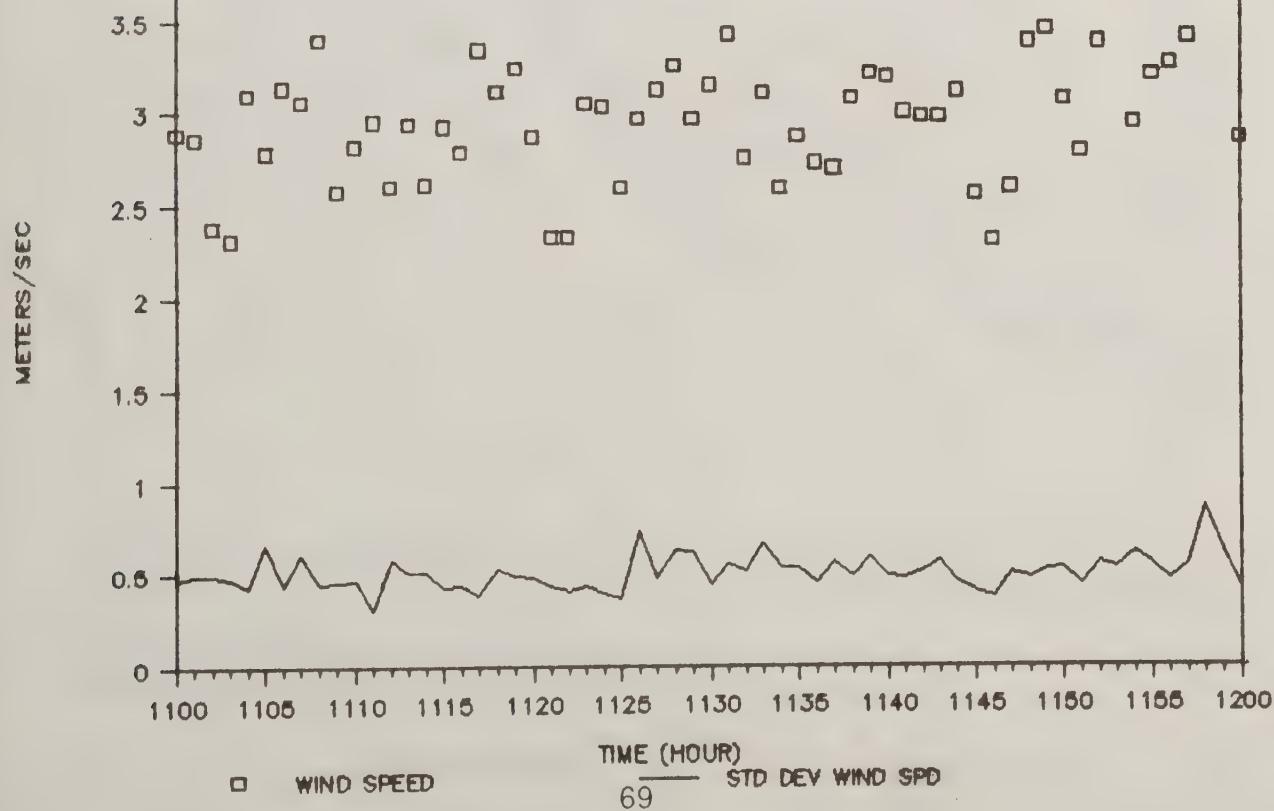
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 17,1991



DAVIS WEATHER DATA STN #1

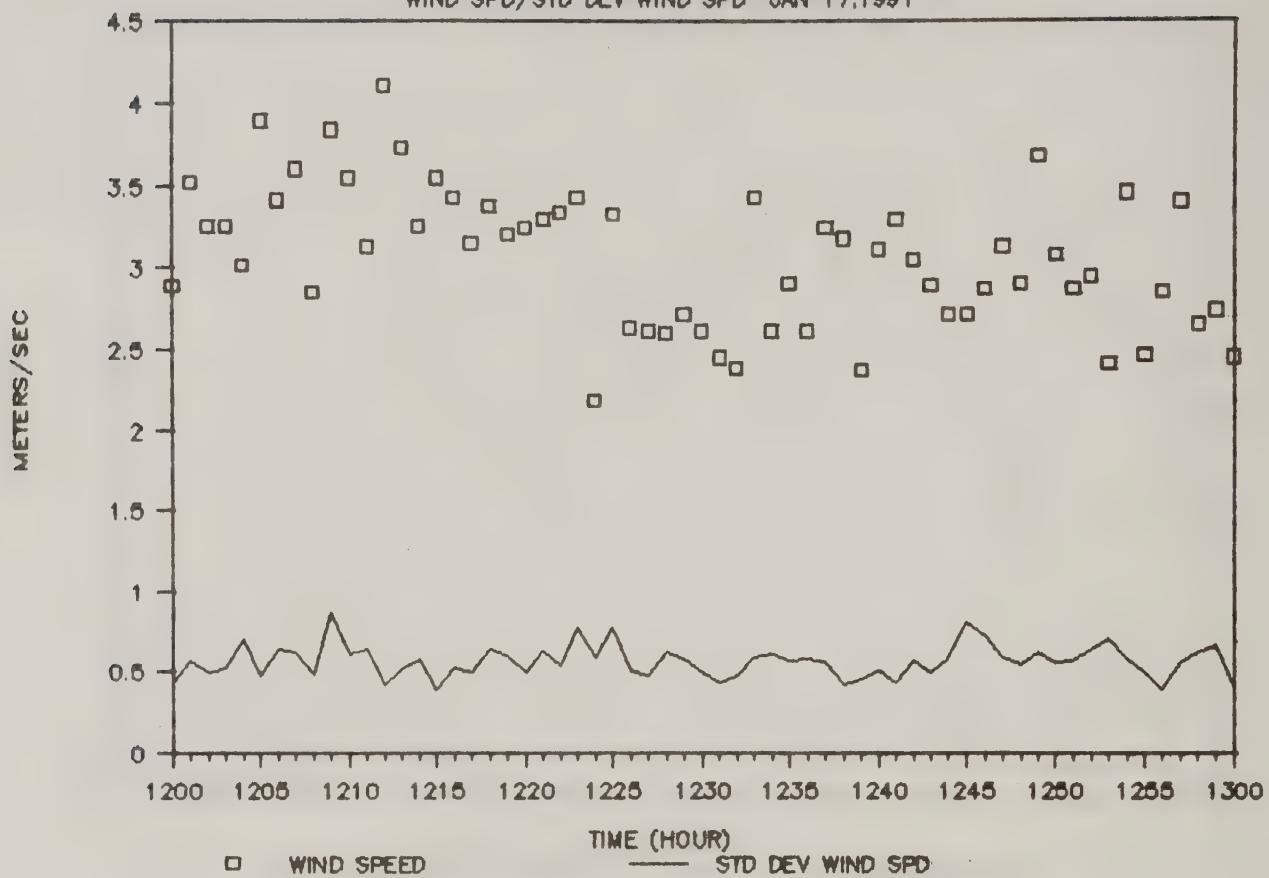
WIND SPD/STD DEV WIND SPD JAN 17,1991



TIME (HOUR) STD DEV WIND SPD

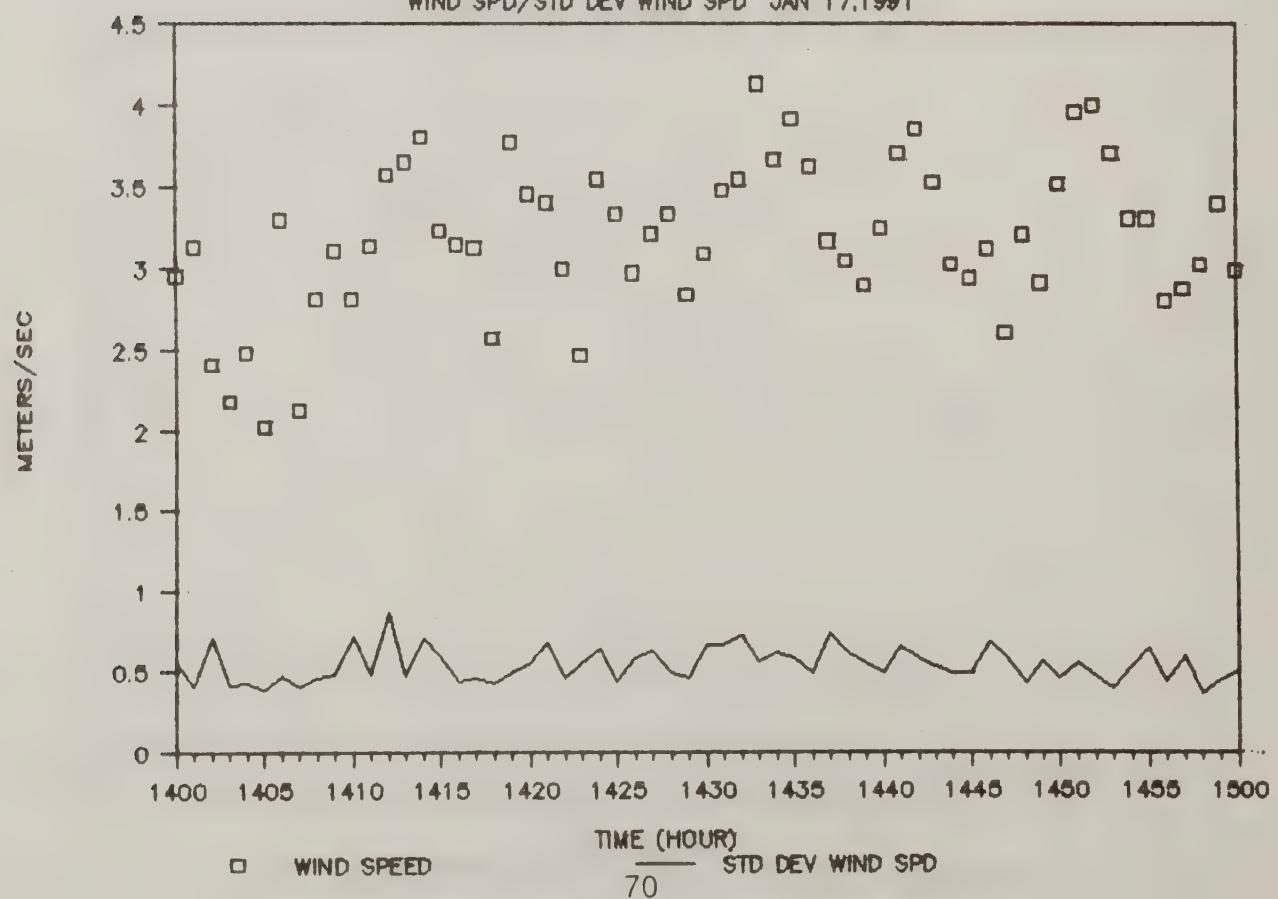
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 17,1991



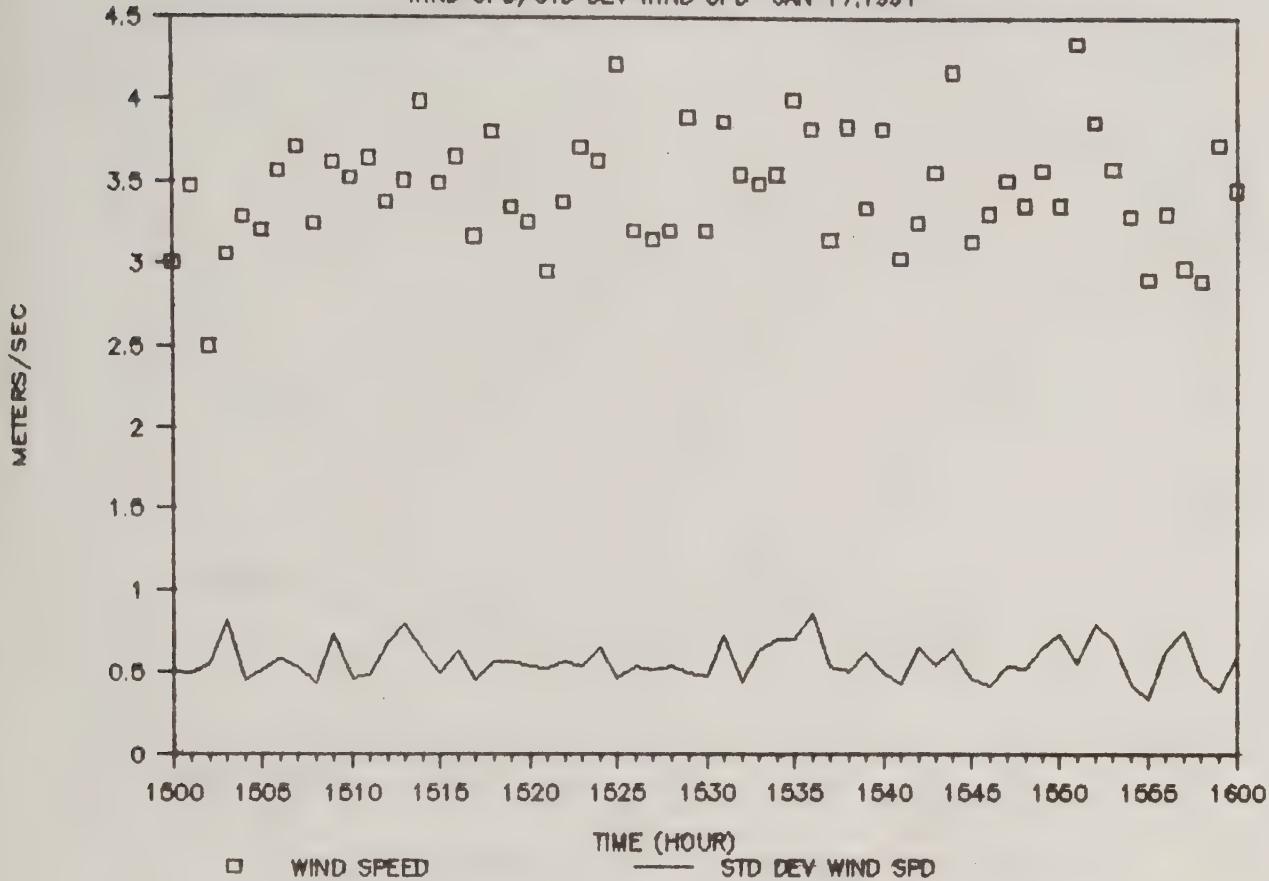
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 17,1991



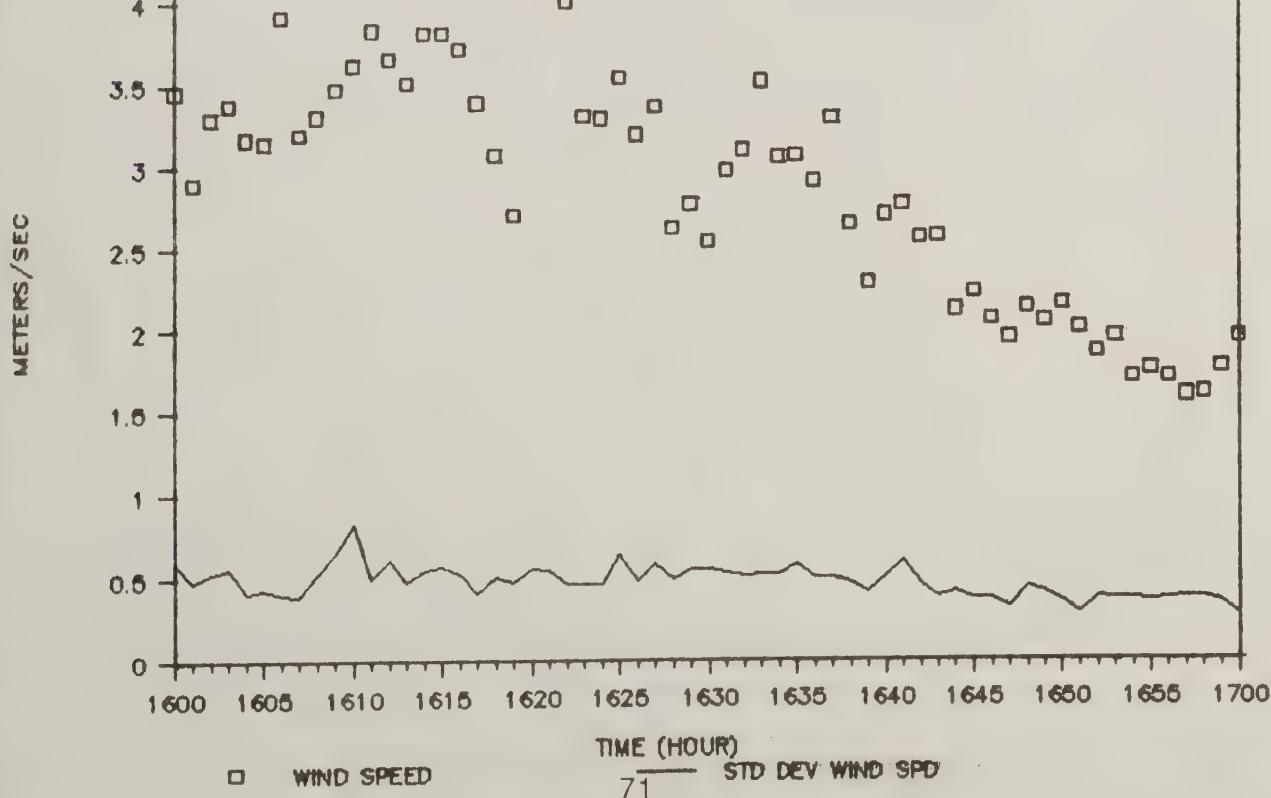
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 17,1991



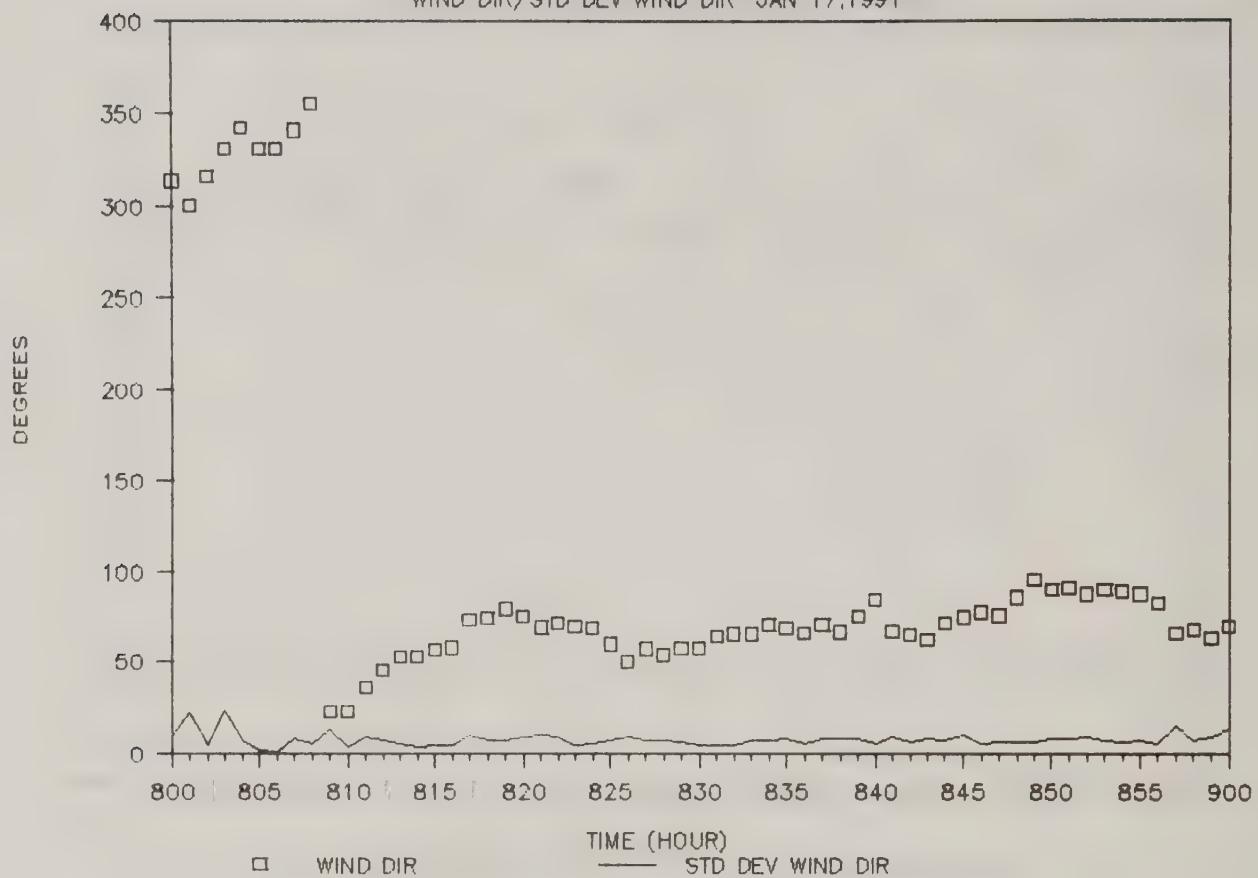
DAVIS WEATHER DATA STN #1

WIND SPD/STD DEV WIND SPD JAN 17,1991



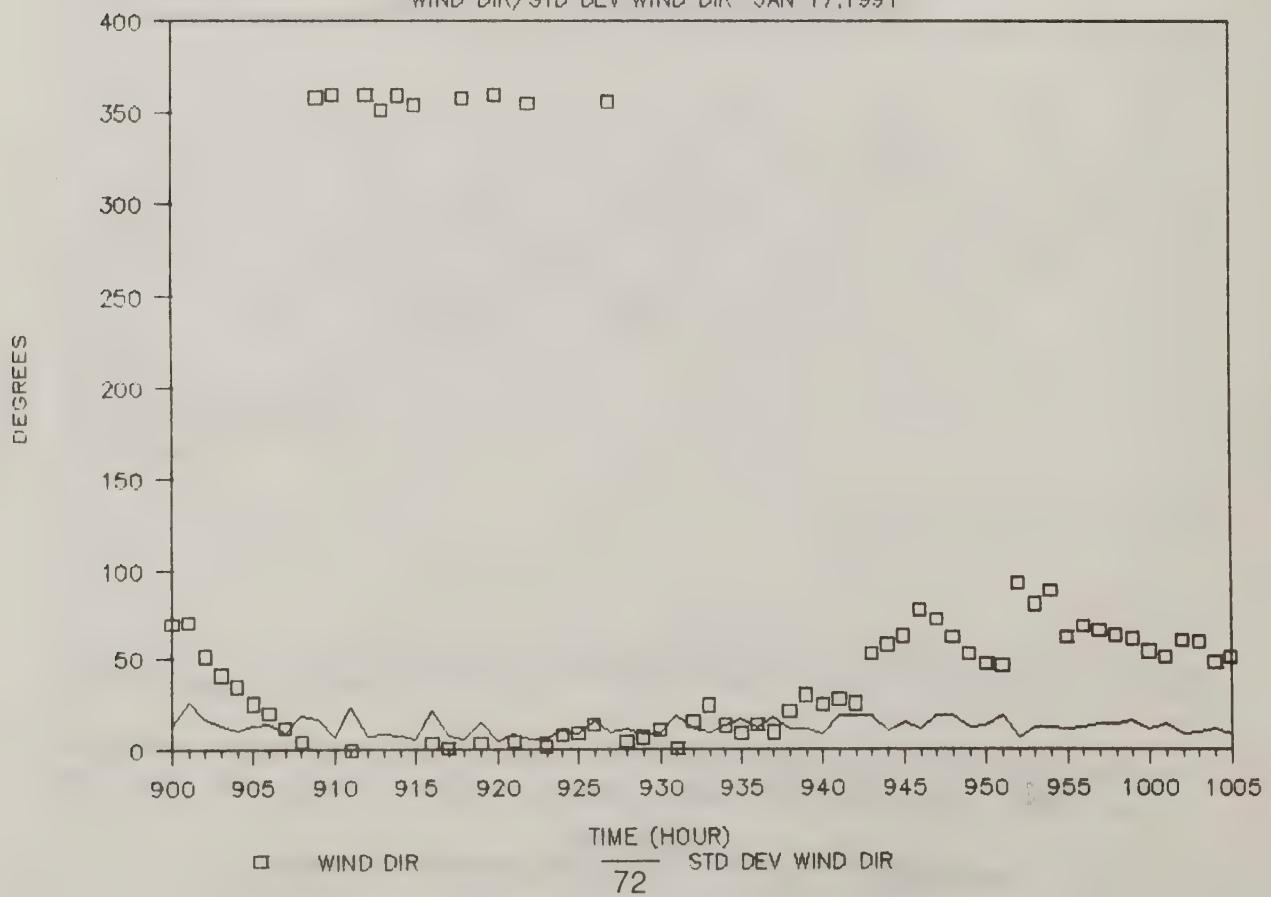
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 17,1991



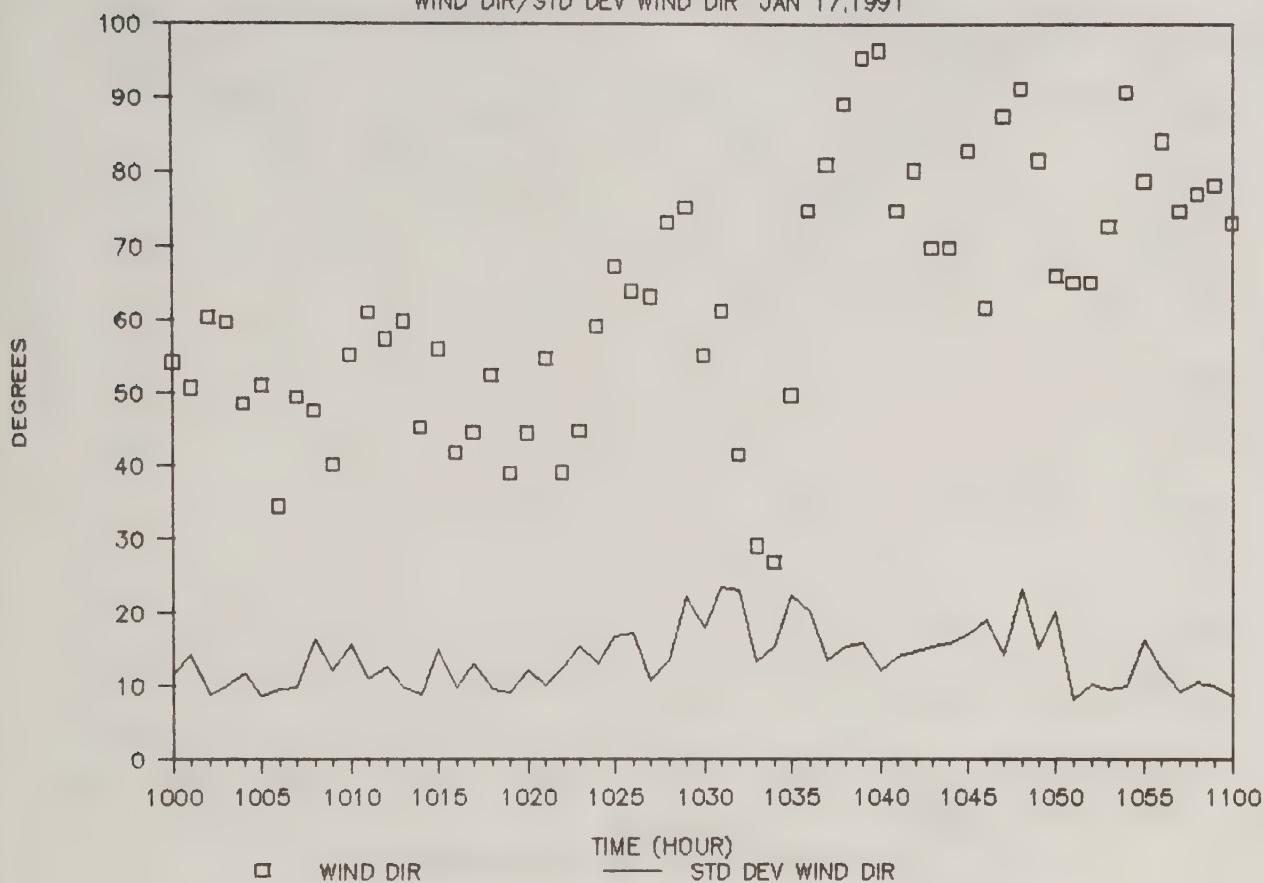
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 17,1991



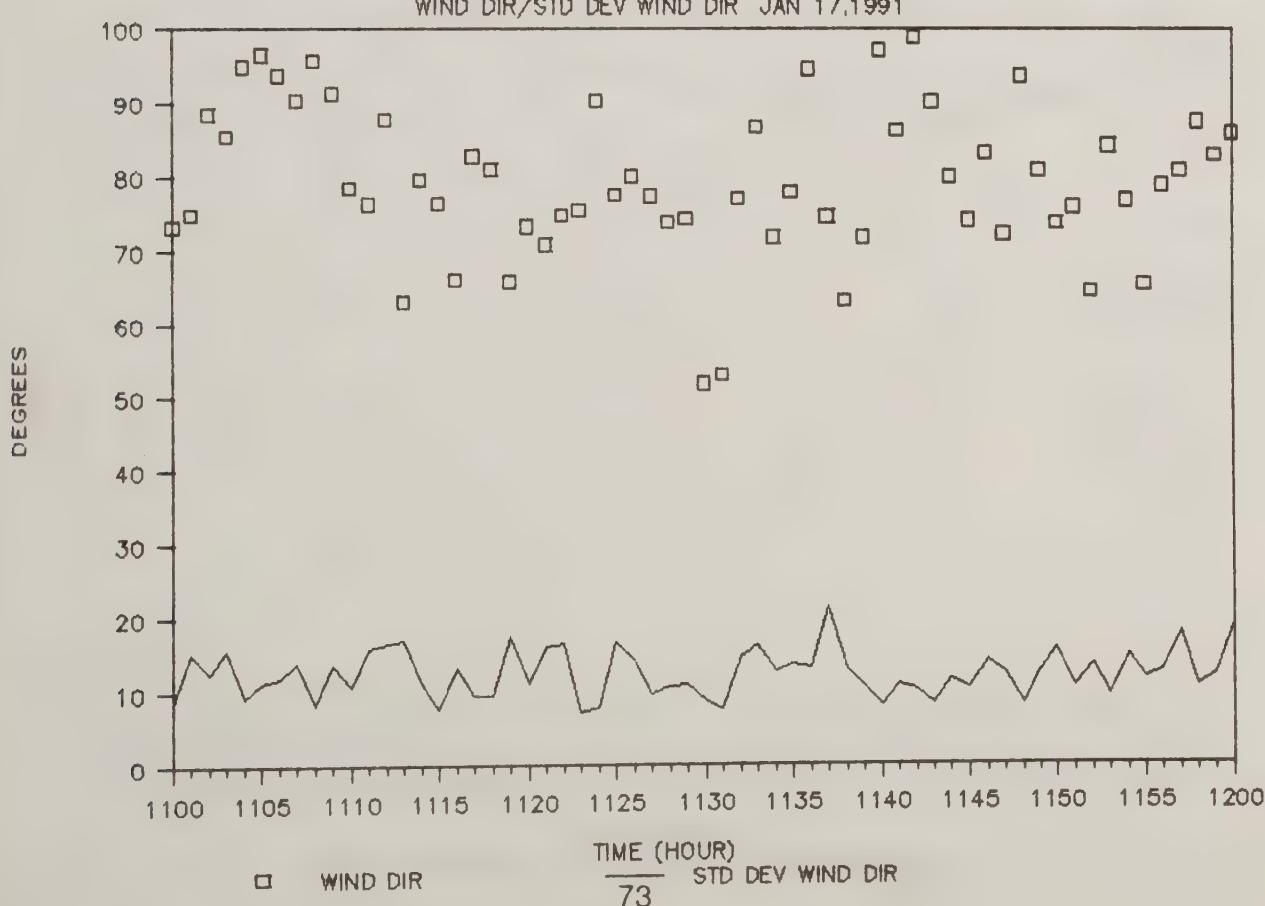
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 17,1991



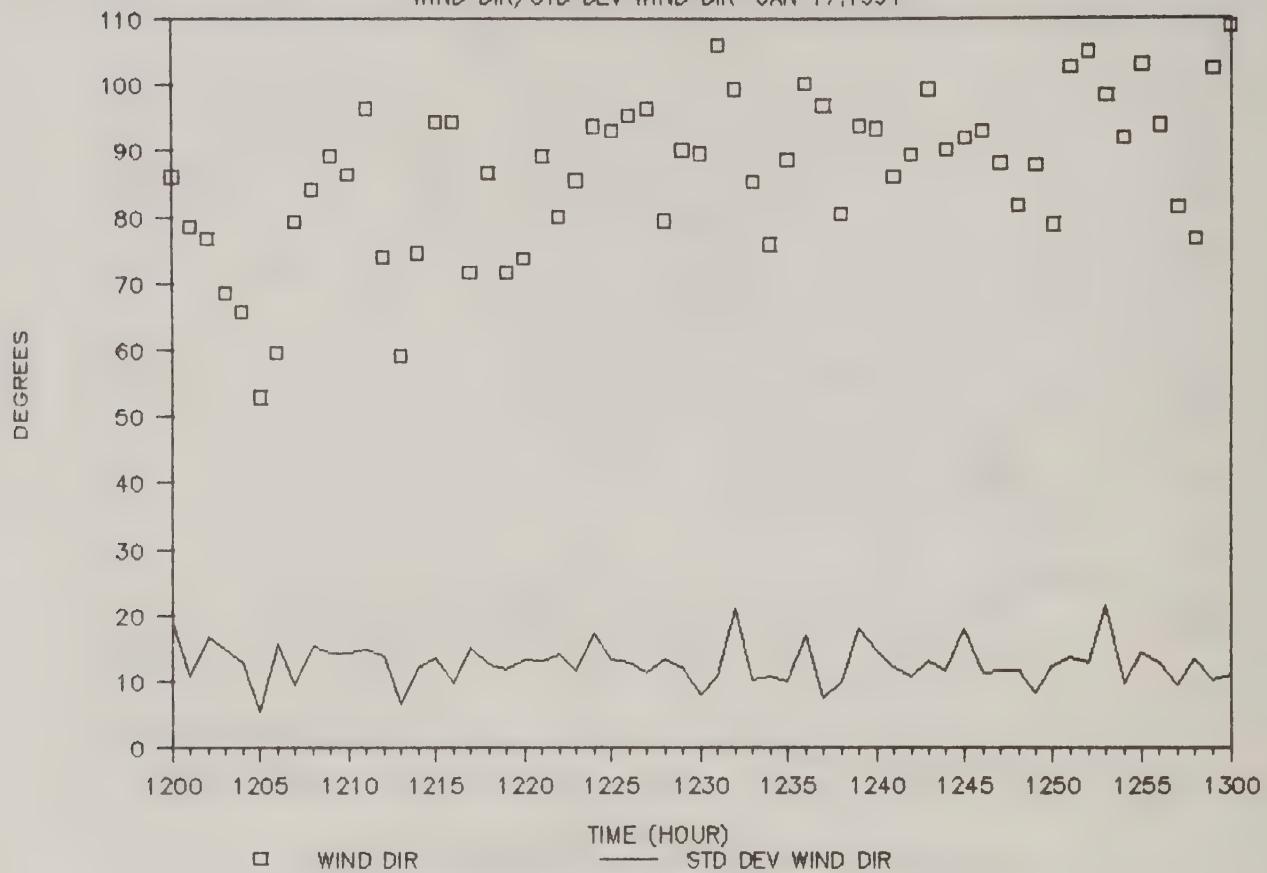
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 17,1991



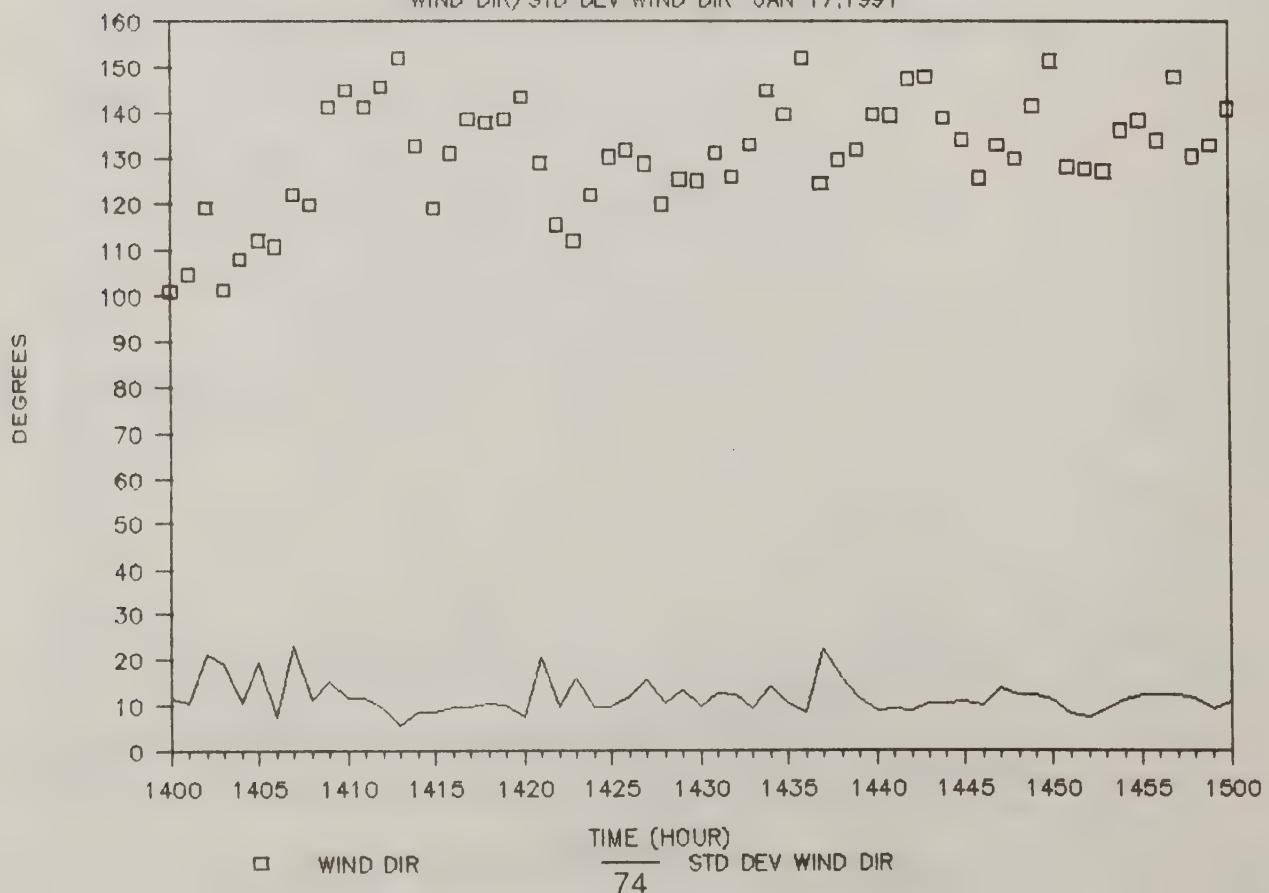
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 17,1991



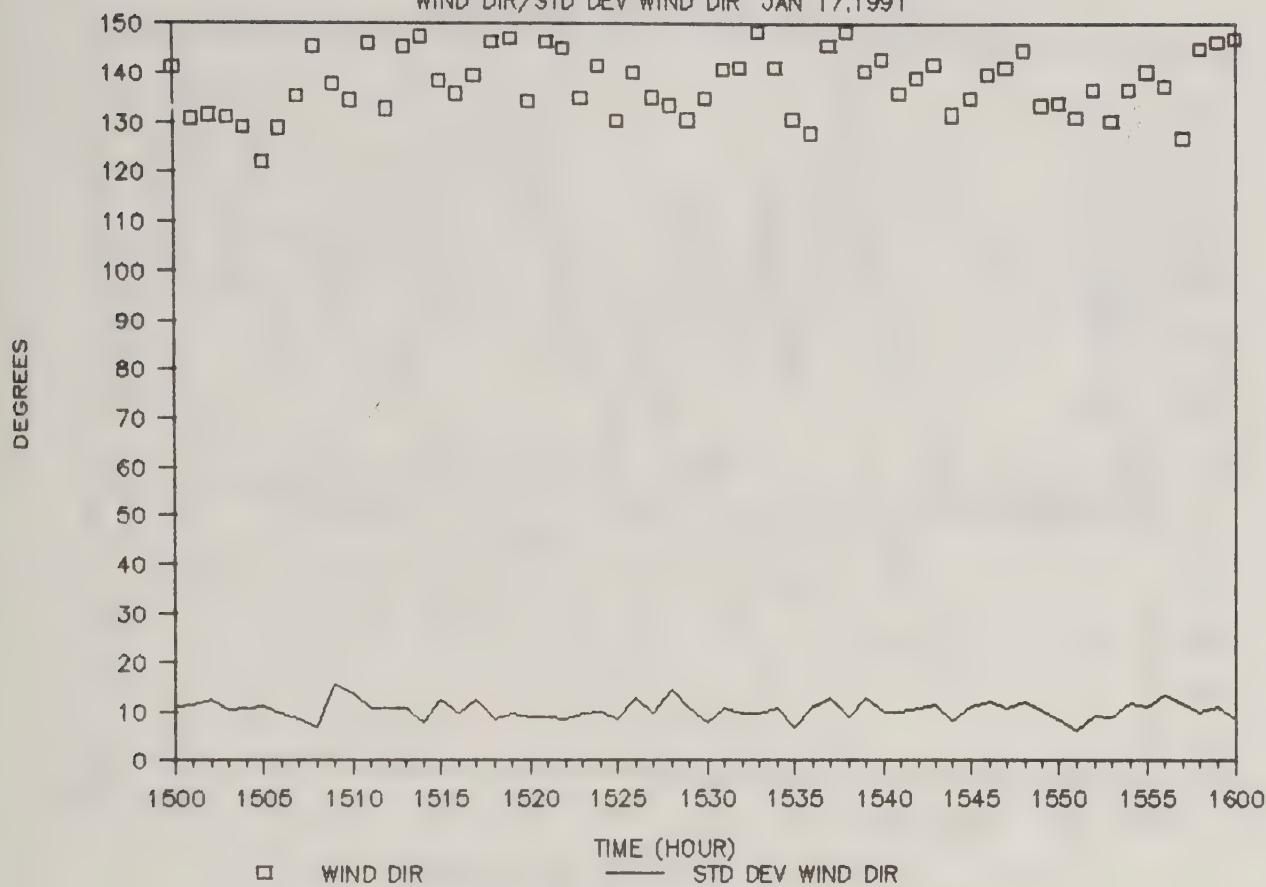
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 17,1991



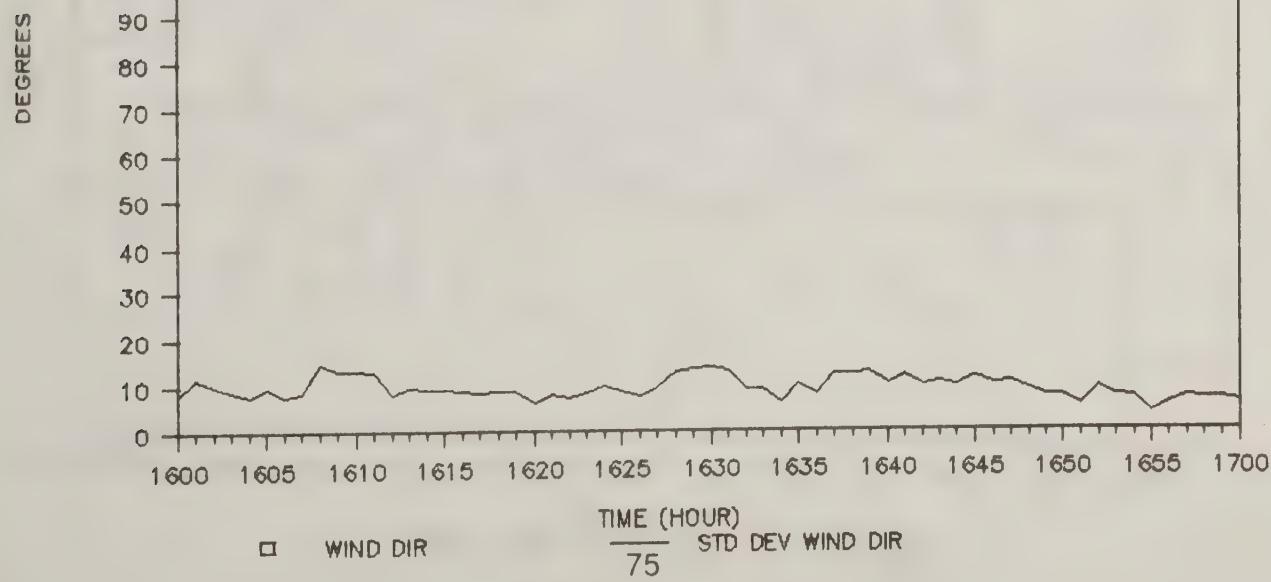
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 17,1991



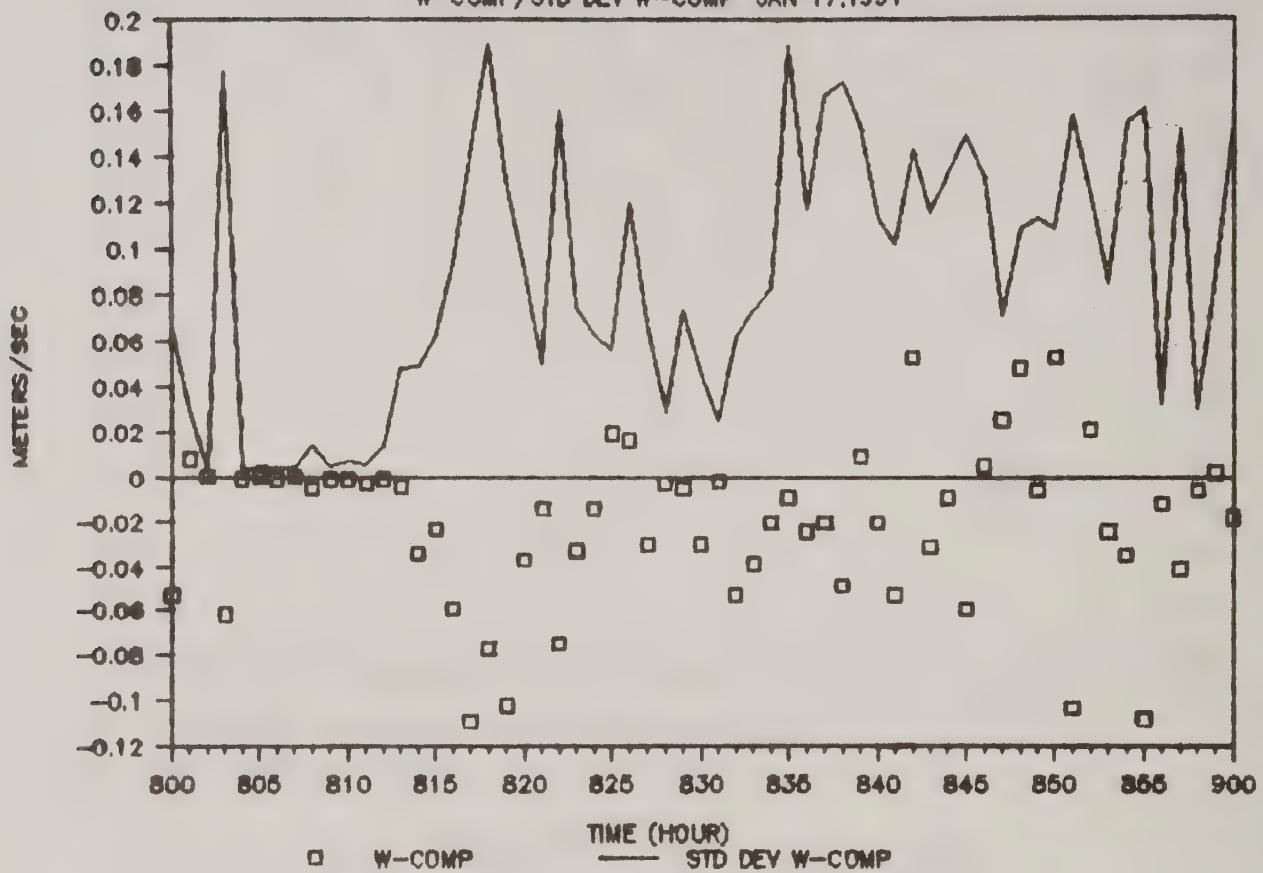
DAVIS WEATHER DATA STN #1

WIND DIR/STD DEV WIND DIR JAN 17,1991



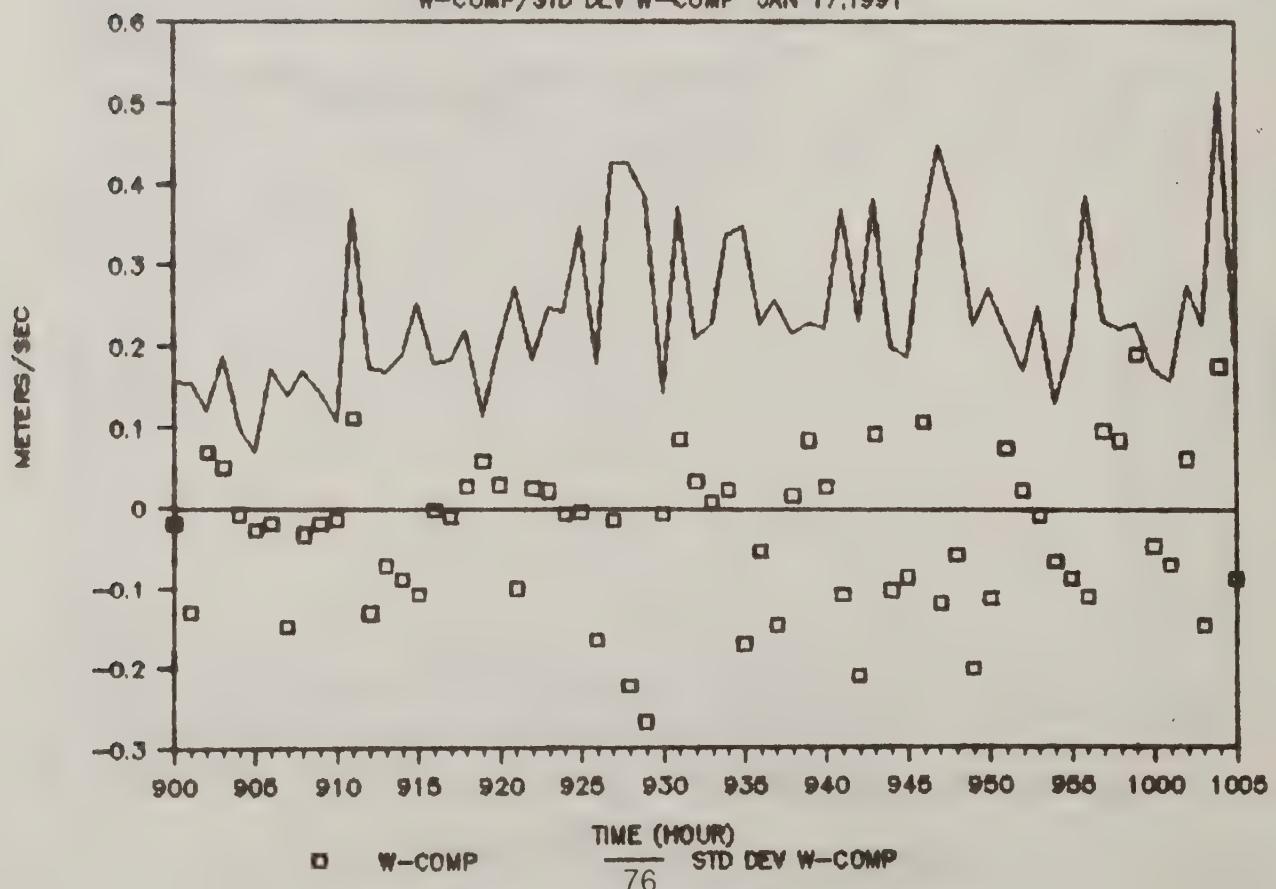
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 17,1991



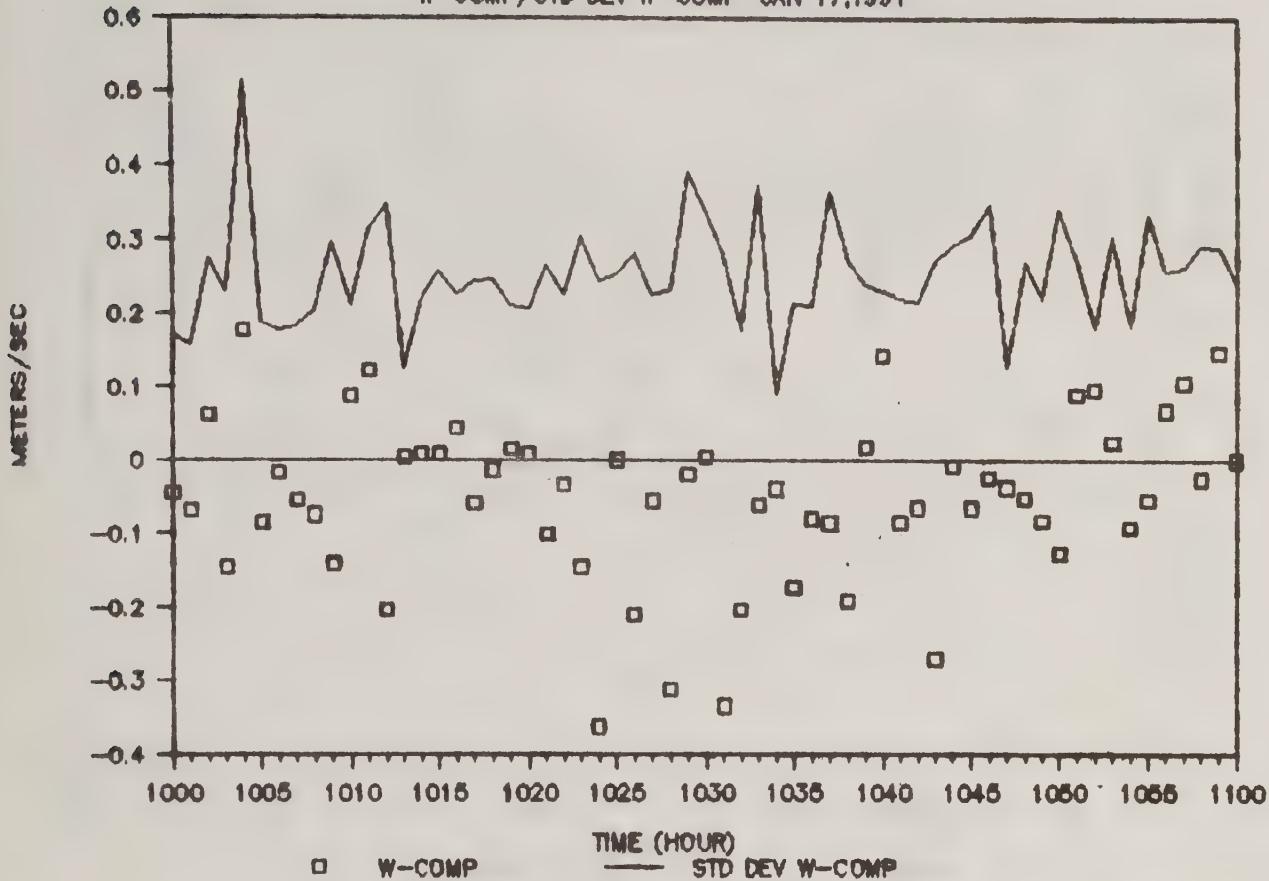
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 17,1991



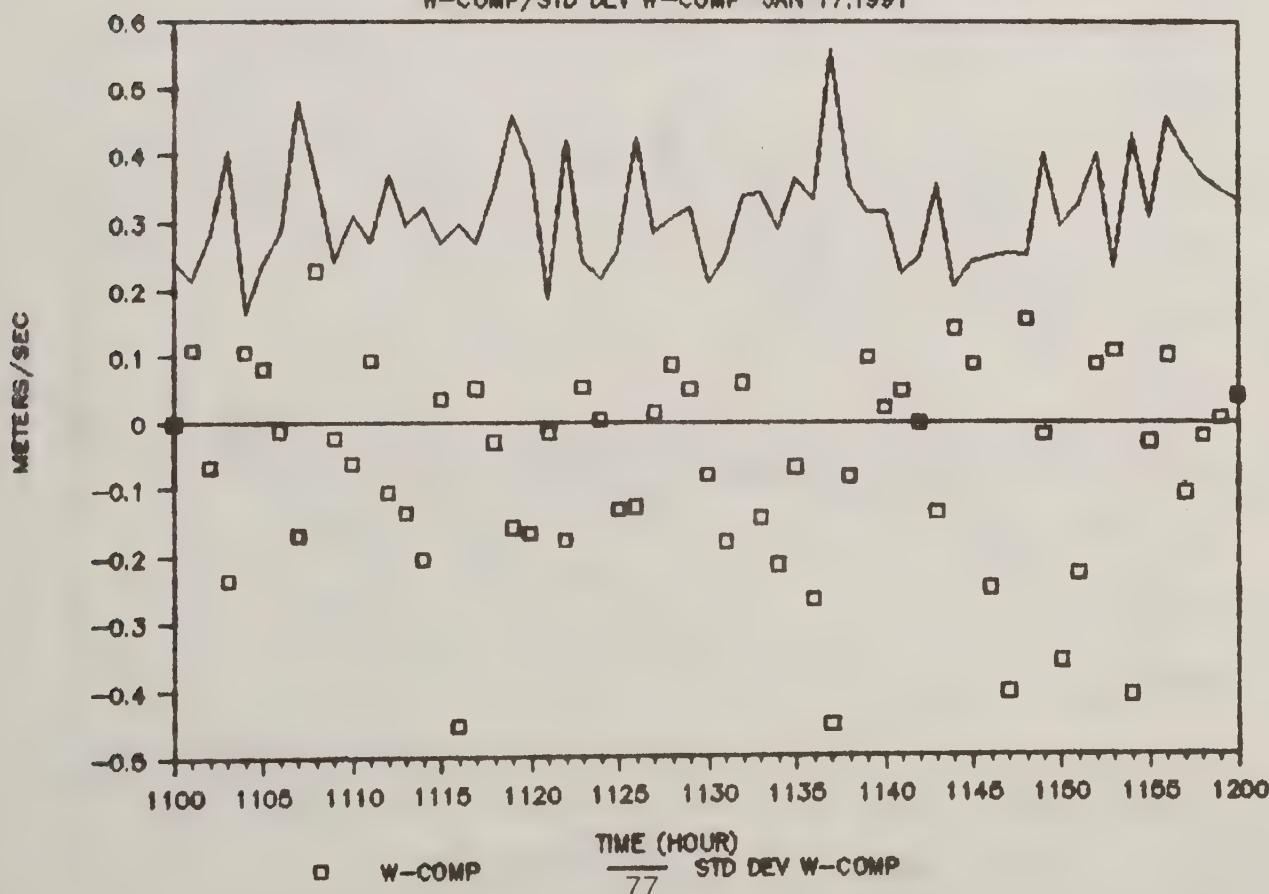
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 17,1991



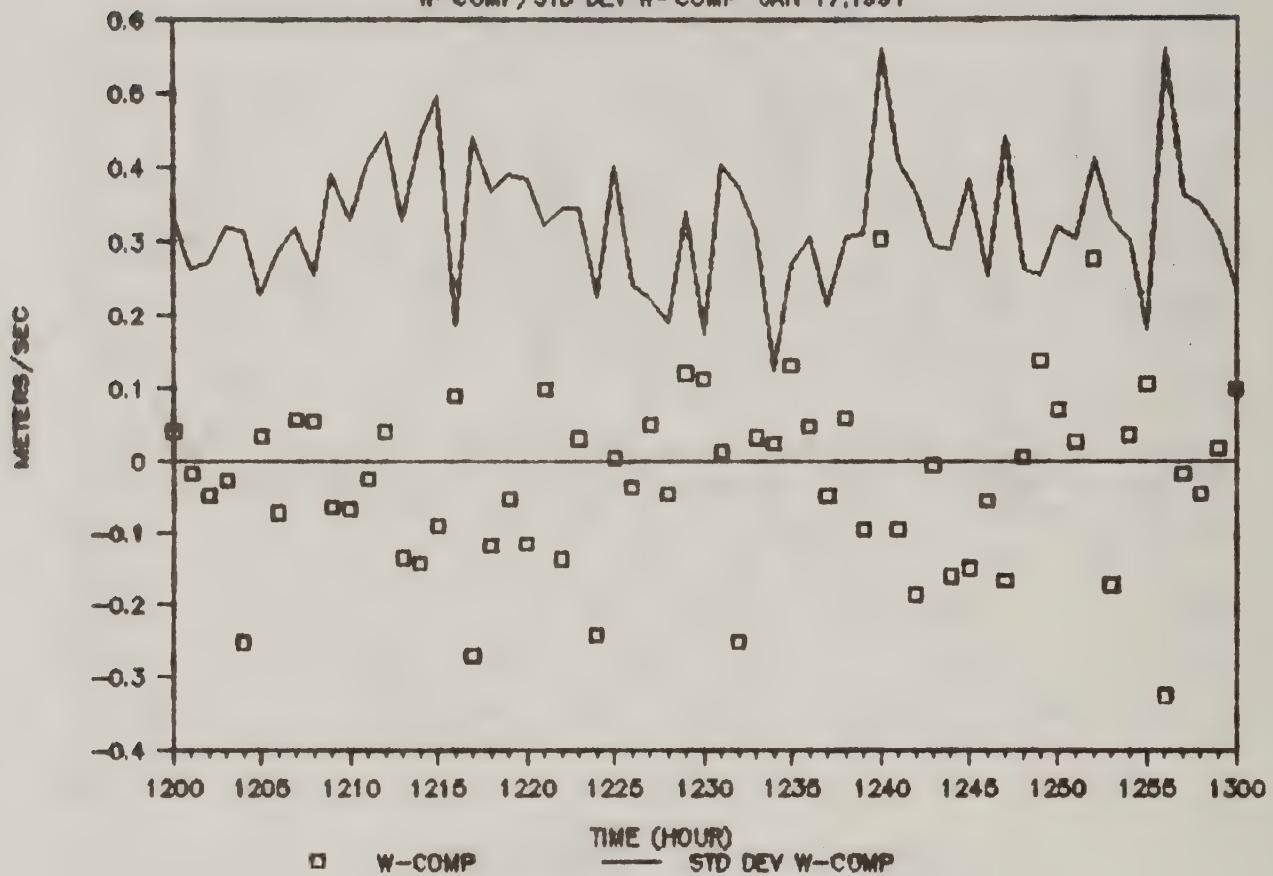
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 17,1991



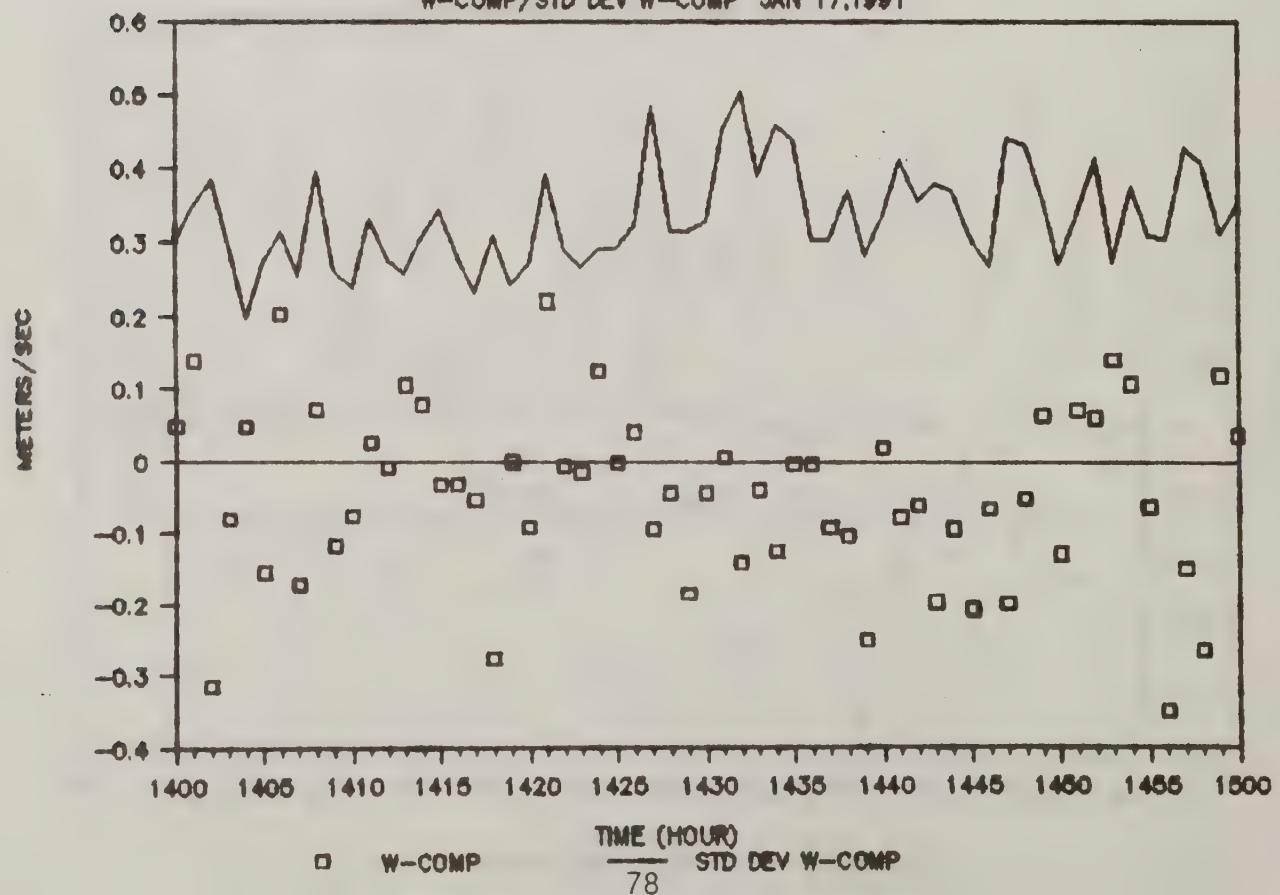
DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 17,1991



DAVIS WEATHER DATA STN #1

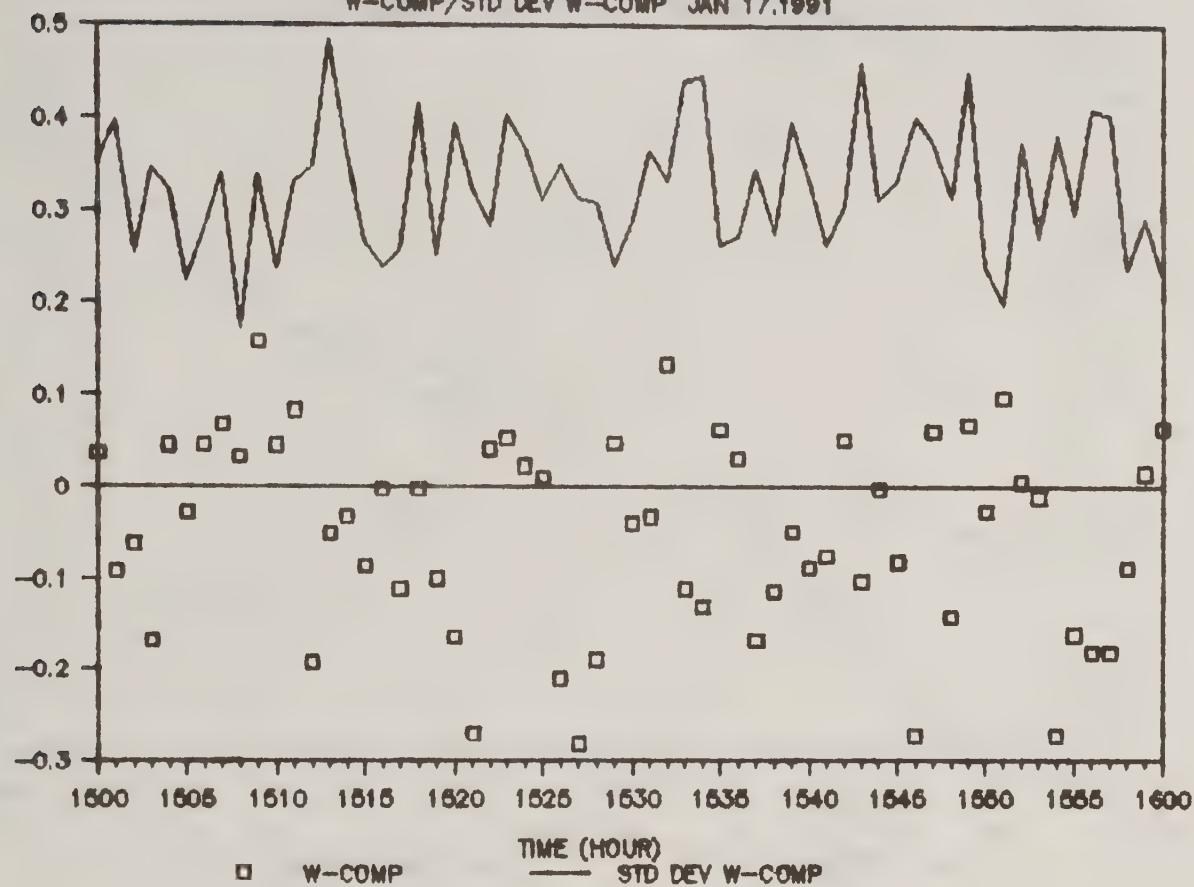
W-COMP/STD DEV W-COMP JAN 17,1991



DAVIS WEATHER DATA STN #1

W-COMP/STD DEV W-COMP JAN 17,1991

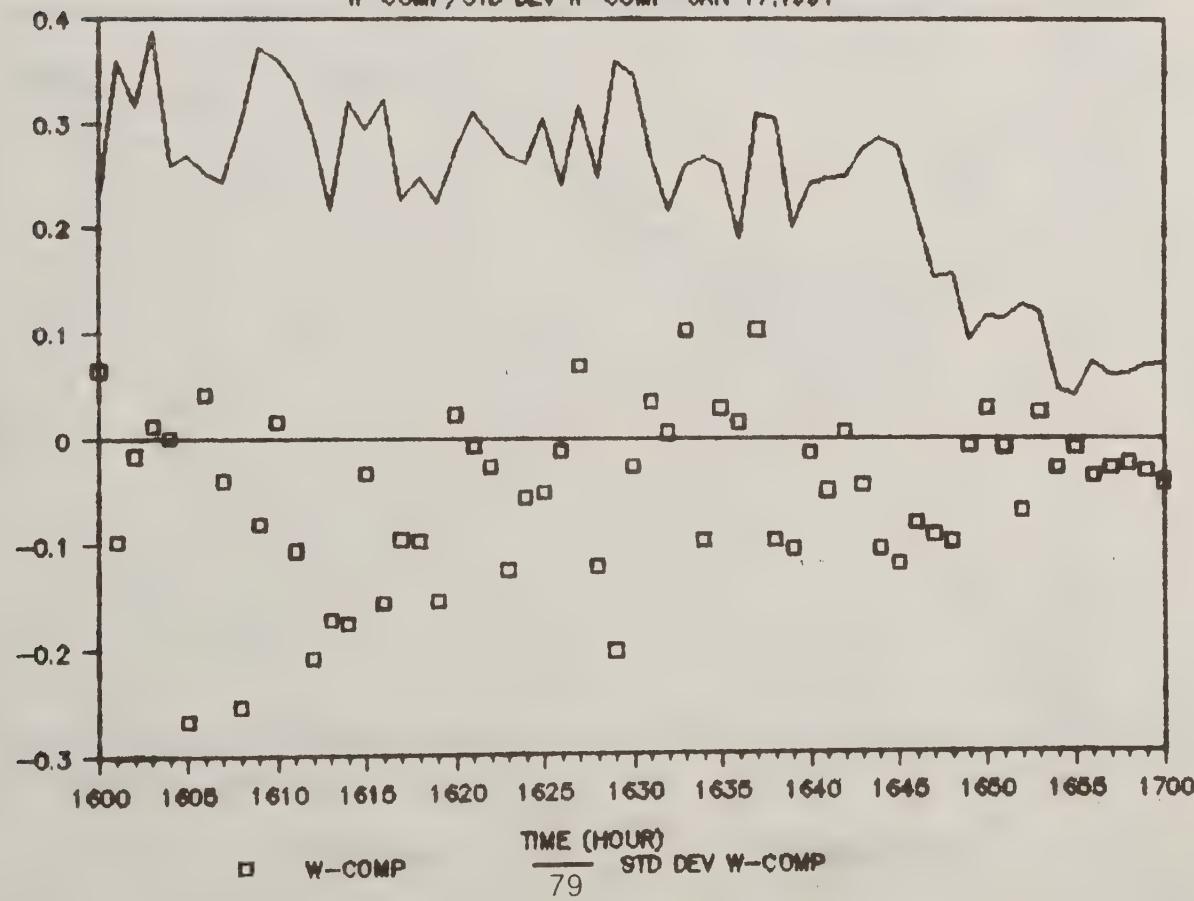
METERS/SEC



DAVIS WEATHER DATA STN #1

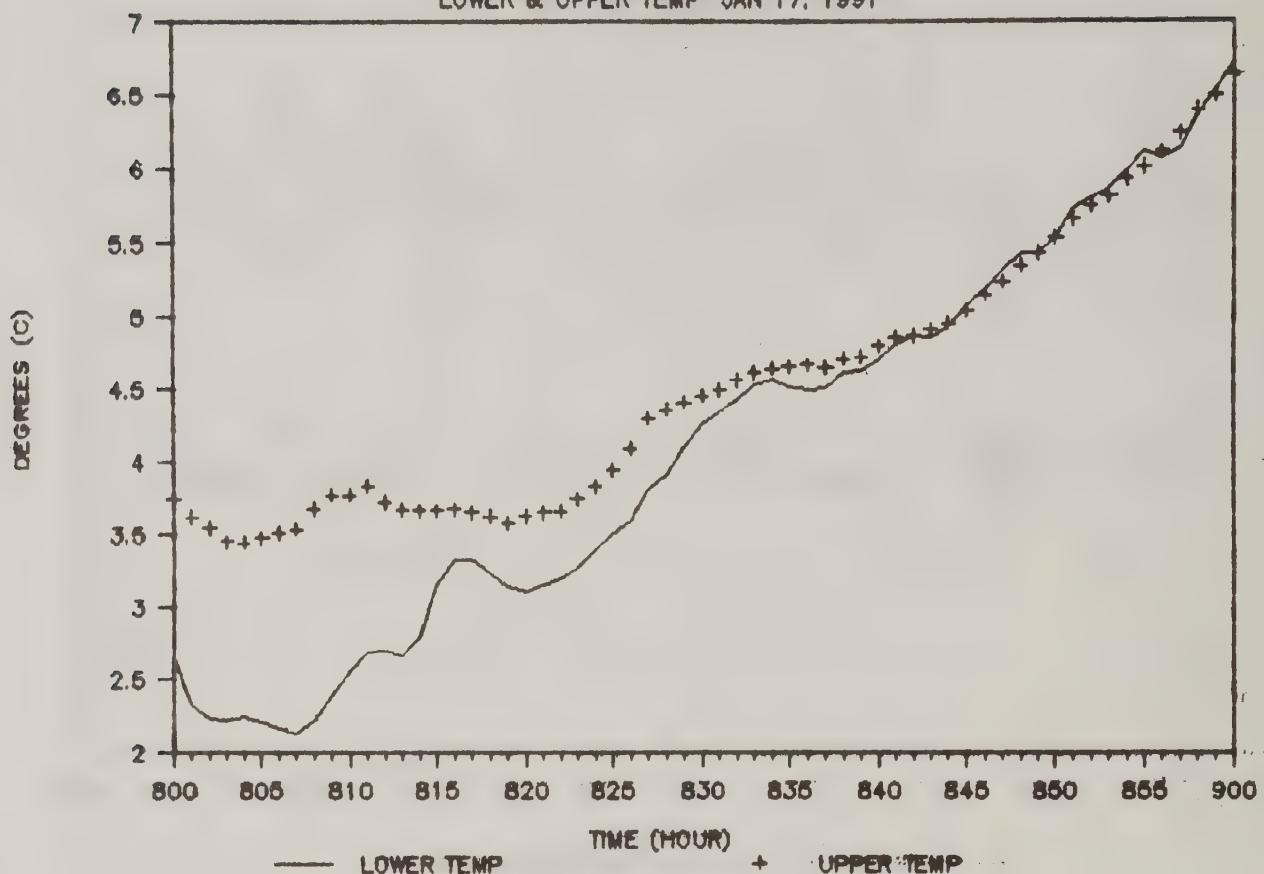
W-COMP/STD DEV W-COMP JAN 17,1991

METERS/SEC



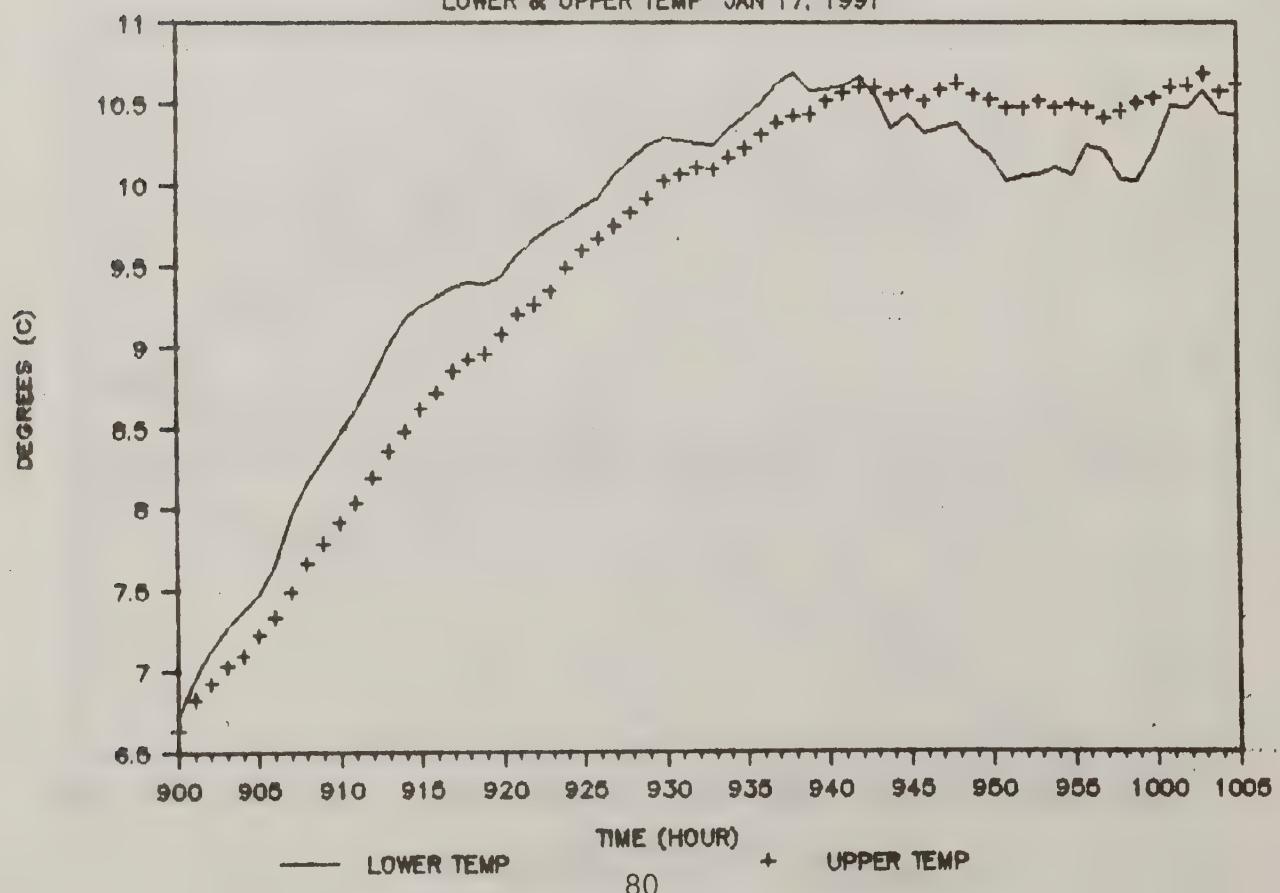
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 17, 1991



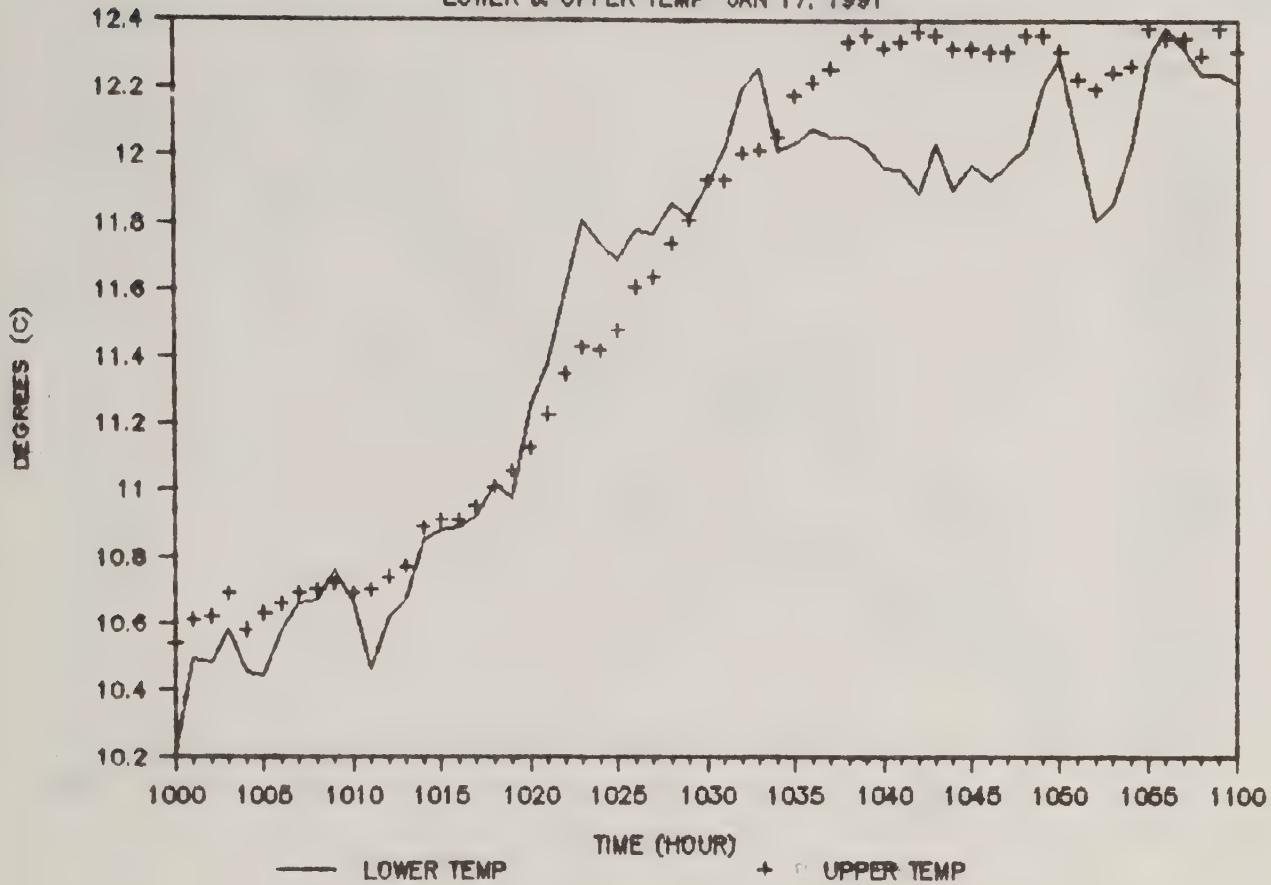
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 17, 1991



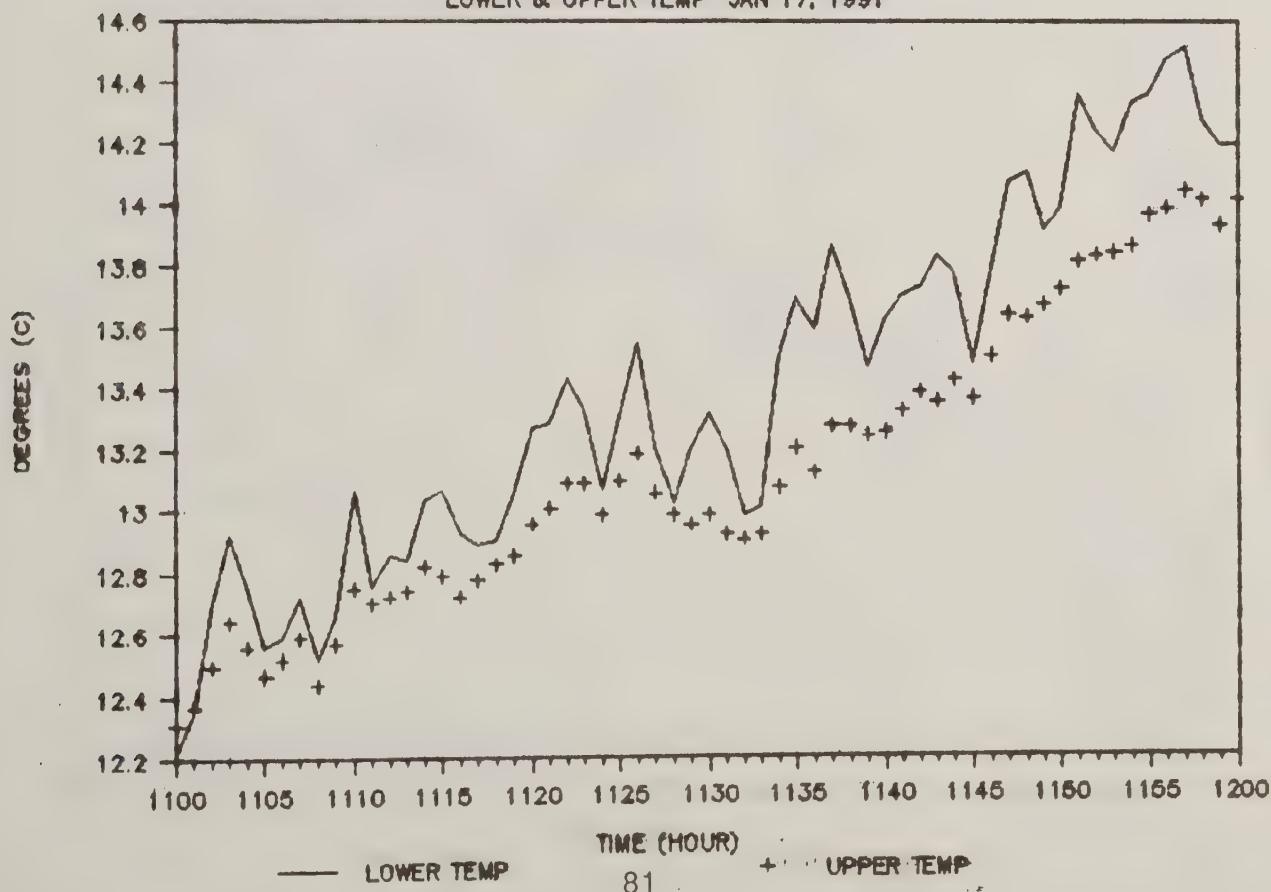
DAVIS WEATHER DATA STN. #1

LOWER & UPPER TEMP JAN 17, 1991



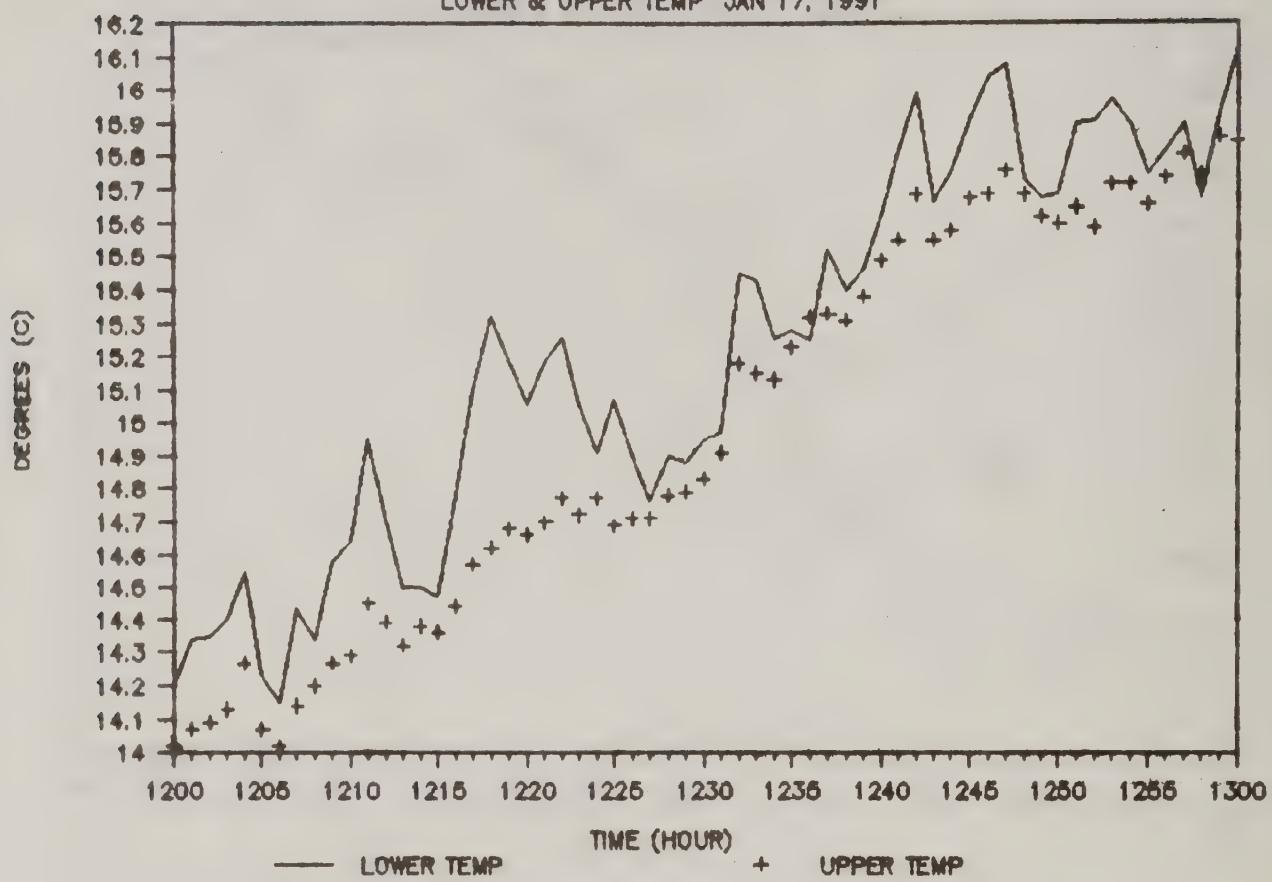
DAVIS WEATHER DATA STN. #1

LOWER & UPPER TEMP JAN 17, 1991



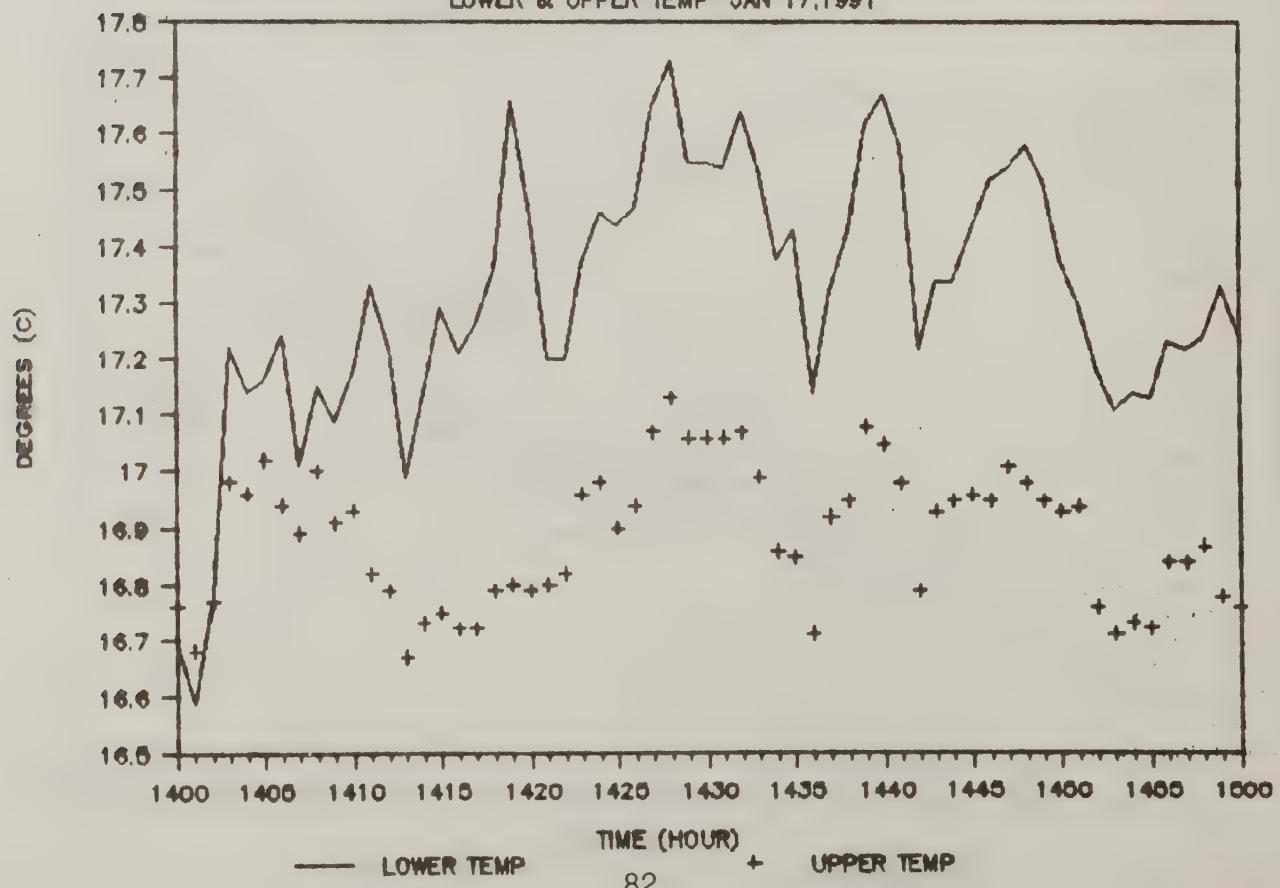
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 17, 1991



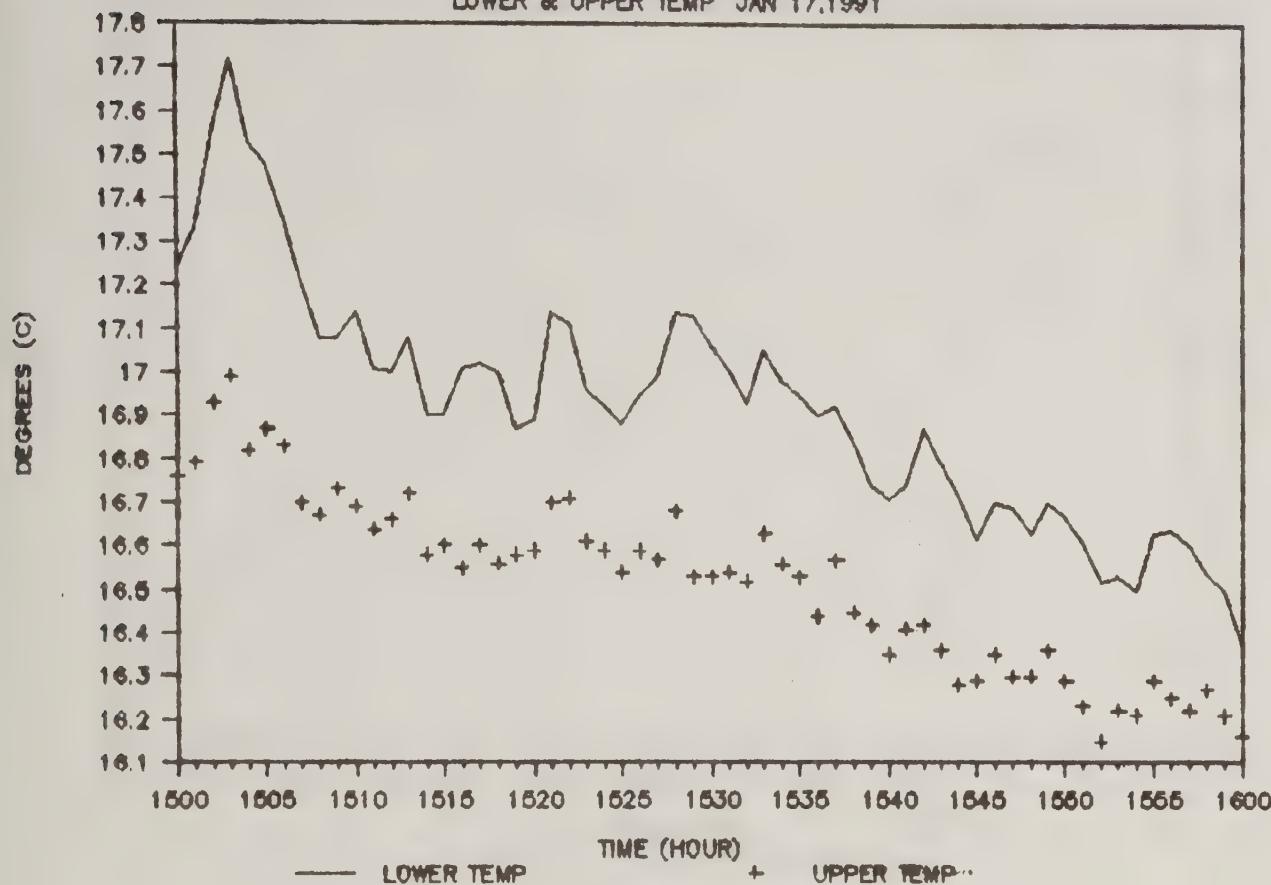
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 17, 1991



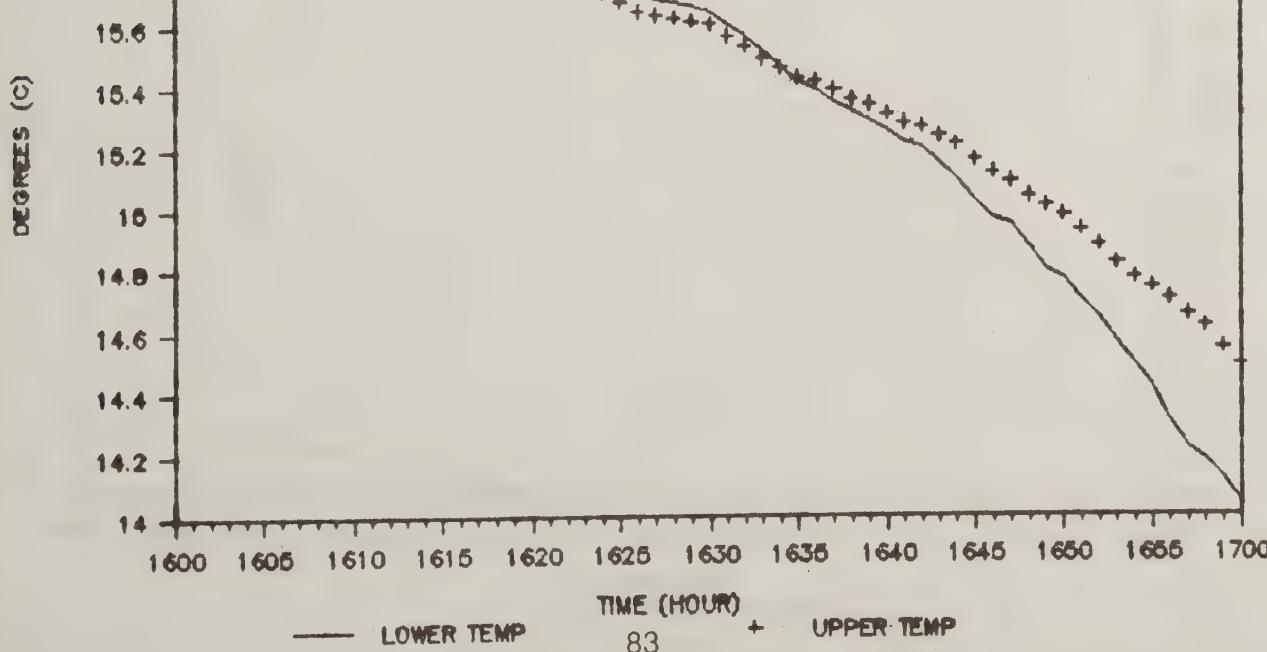
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 17, 1991



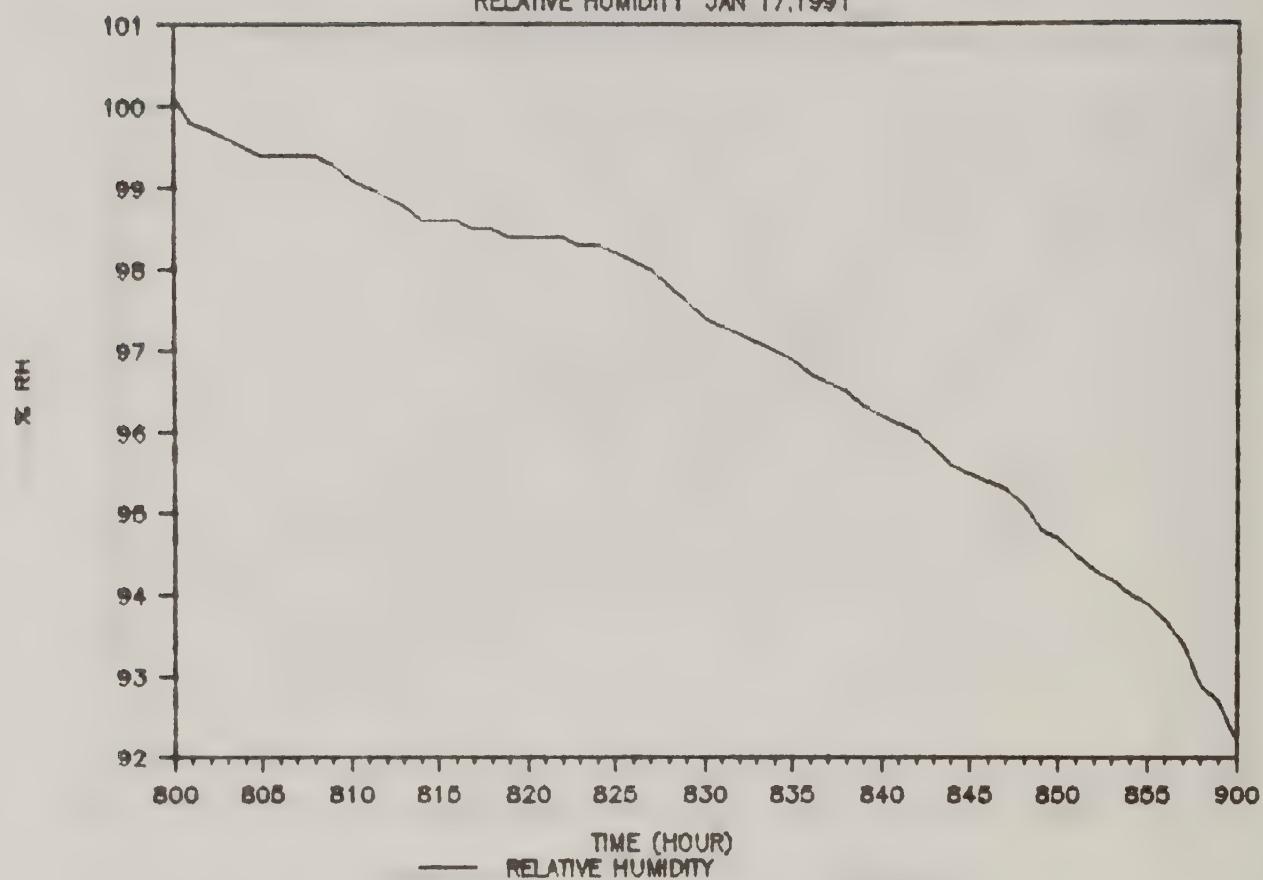
DAVIS WEATHER DATA STN #1

LOWER & UPPER TEMP JAN 17, 1991



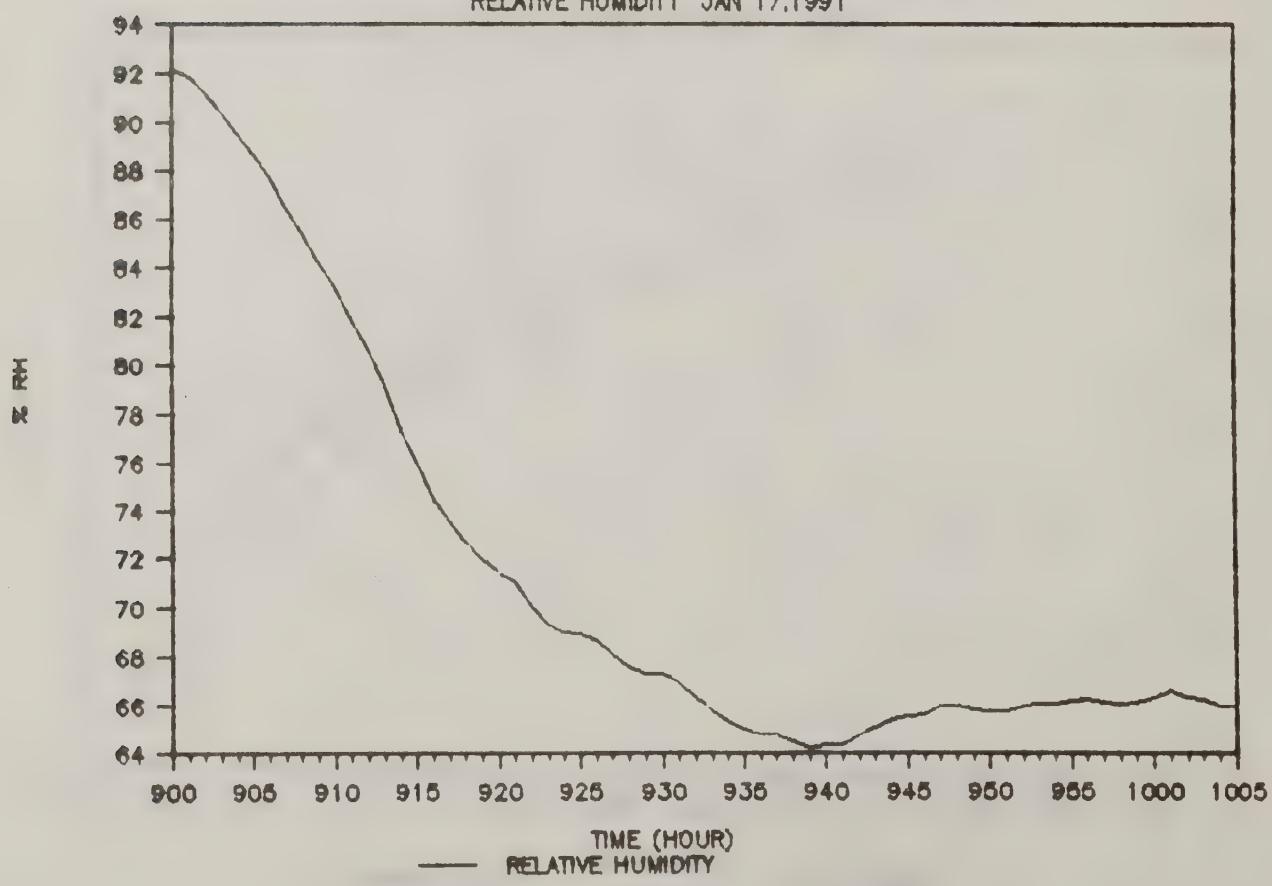
DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 17, 1991

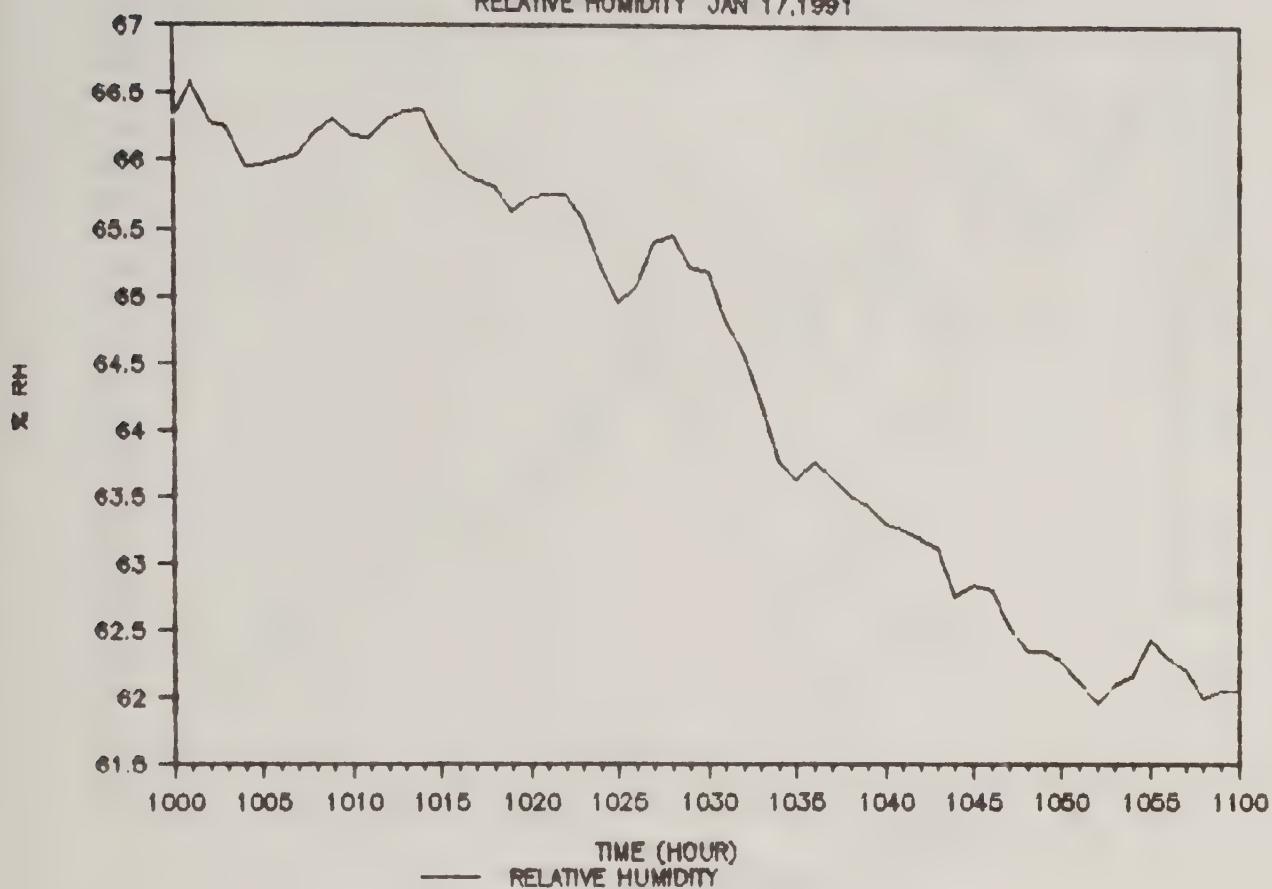


DAVIS WEATHER DATA STN #1

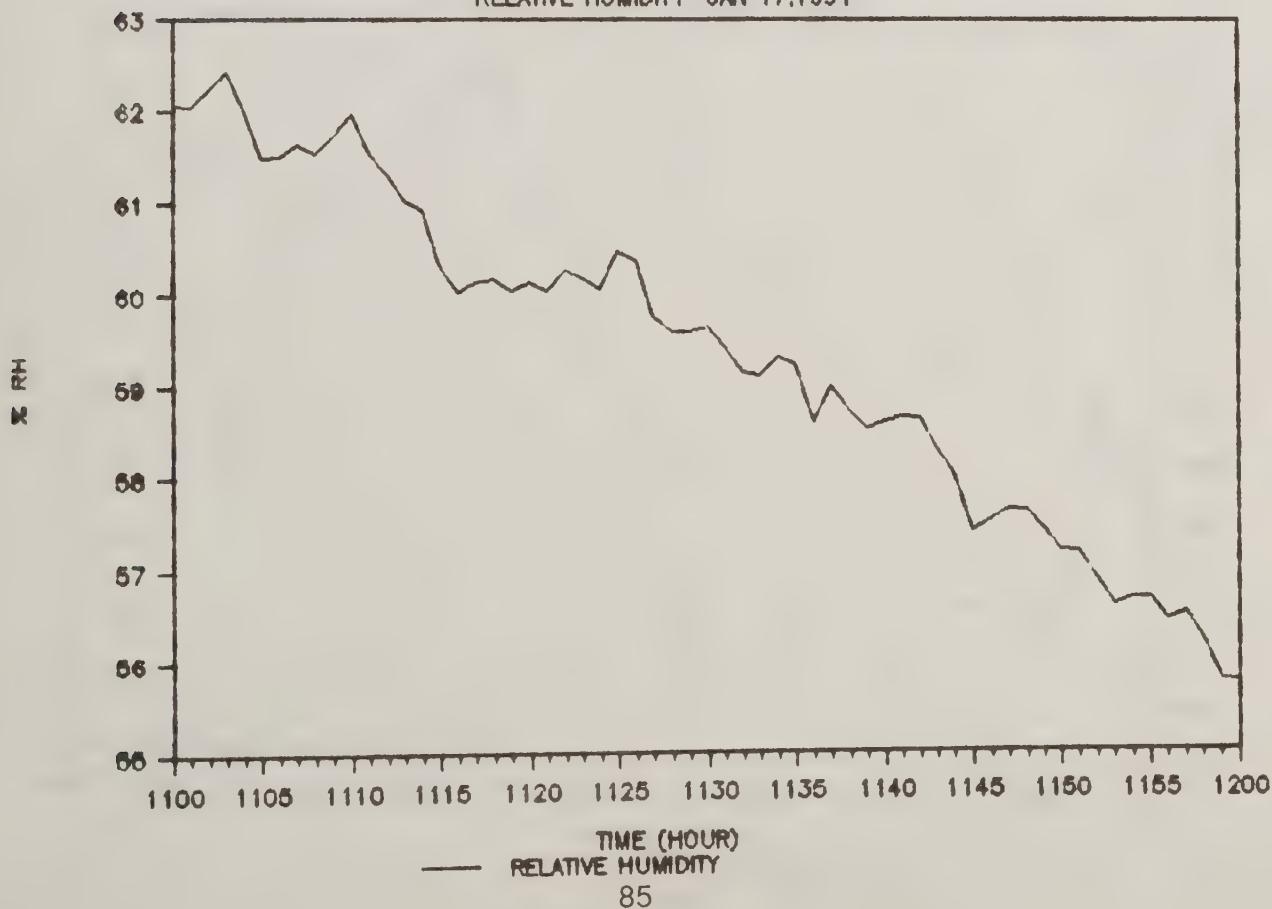
RELATIVE HUMIDITY JAN 17, 1991



DAVIS WEATHER DATA STN #1
RELATIVE HUMIDITY JAN 17,1991

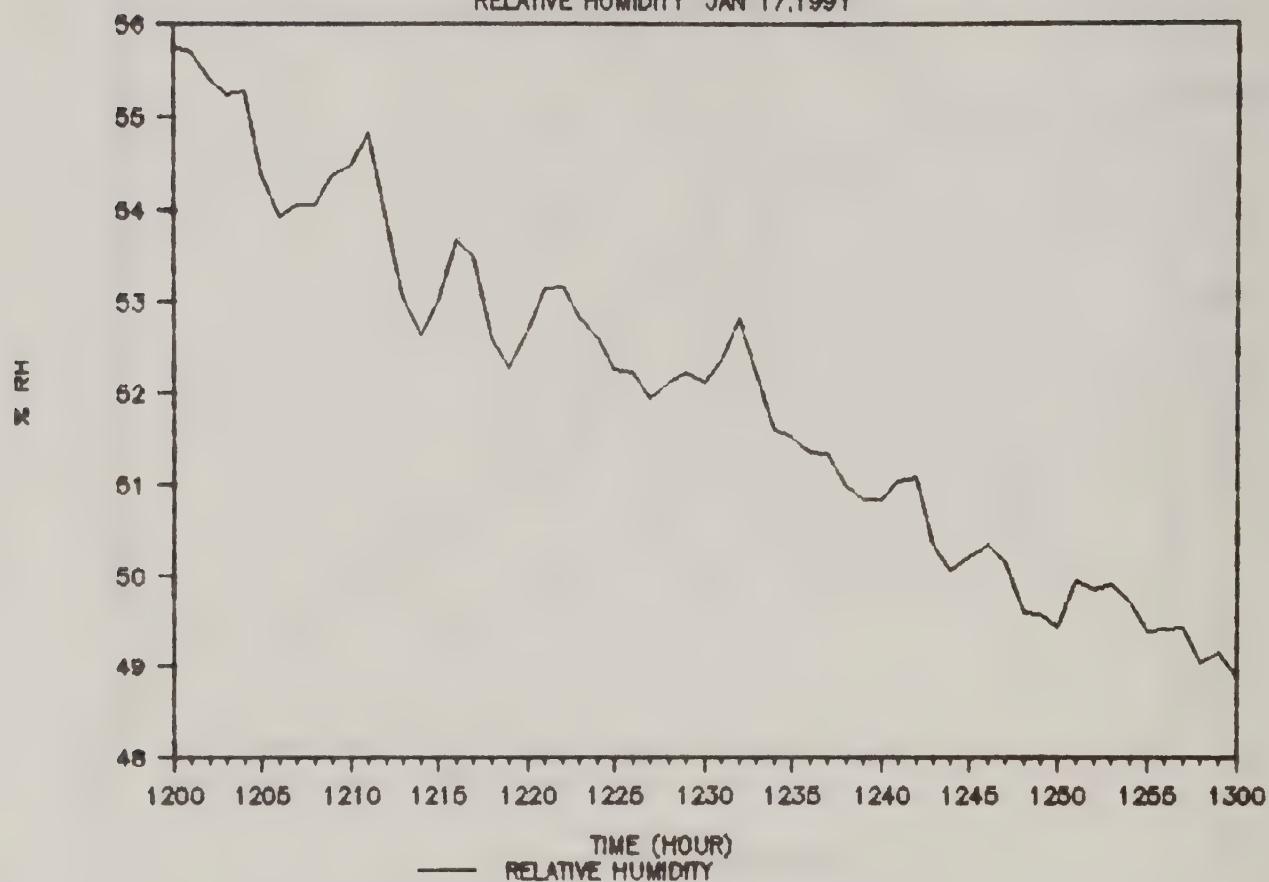


DAVIS WEATHER DATA STN #1
RELATIVE HUMIDITY JAN 17,1991



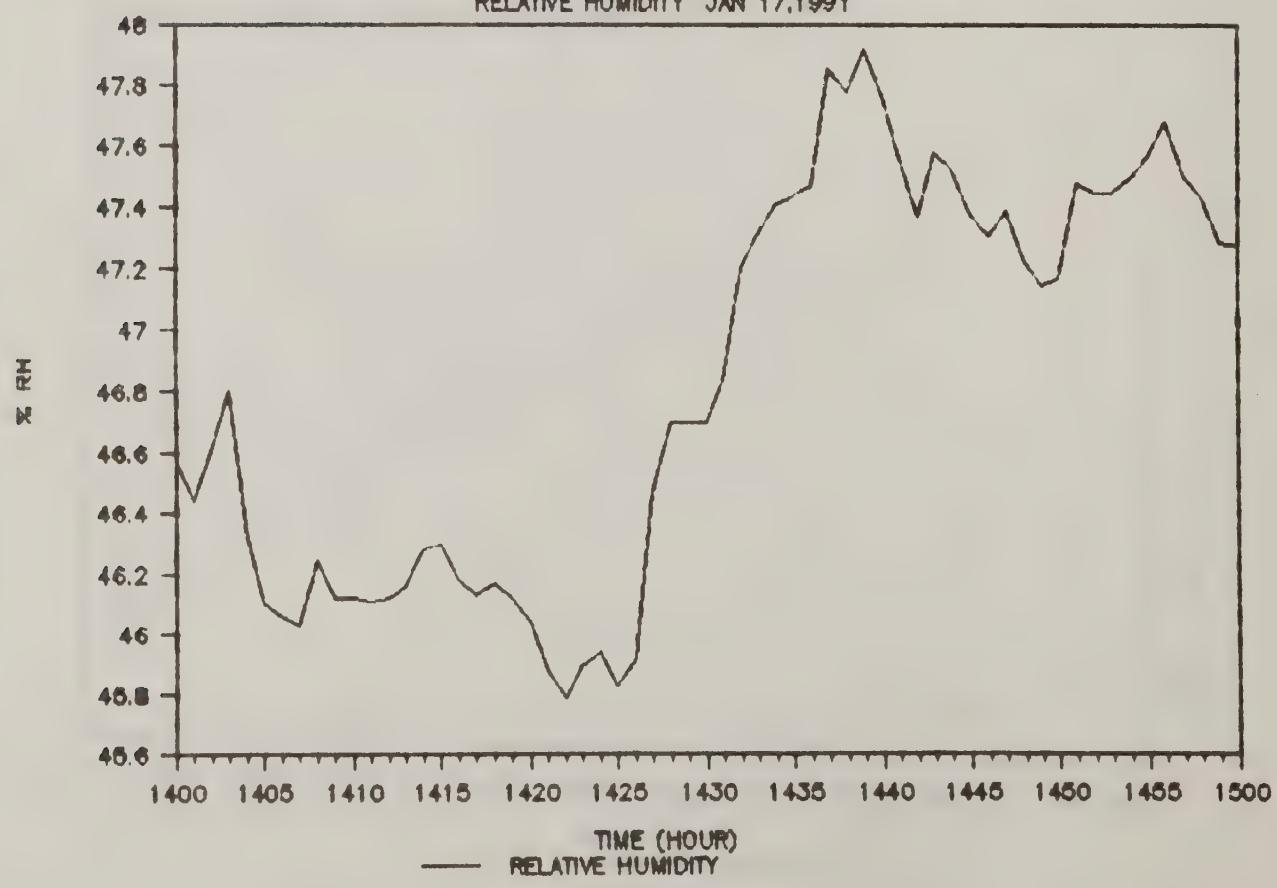
DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 17, 1991



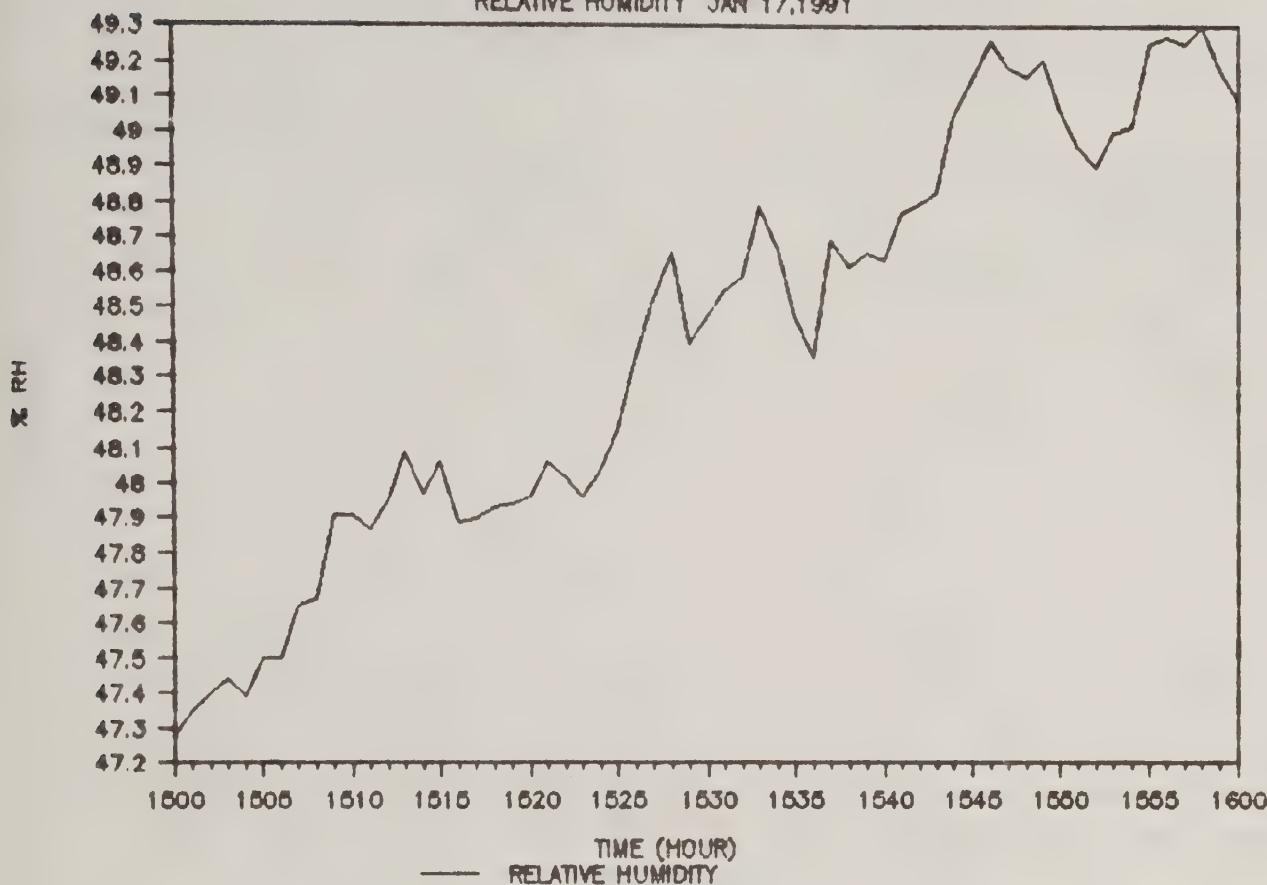
DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 17, 1991



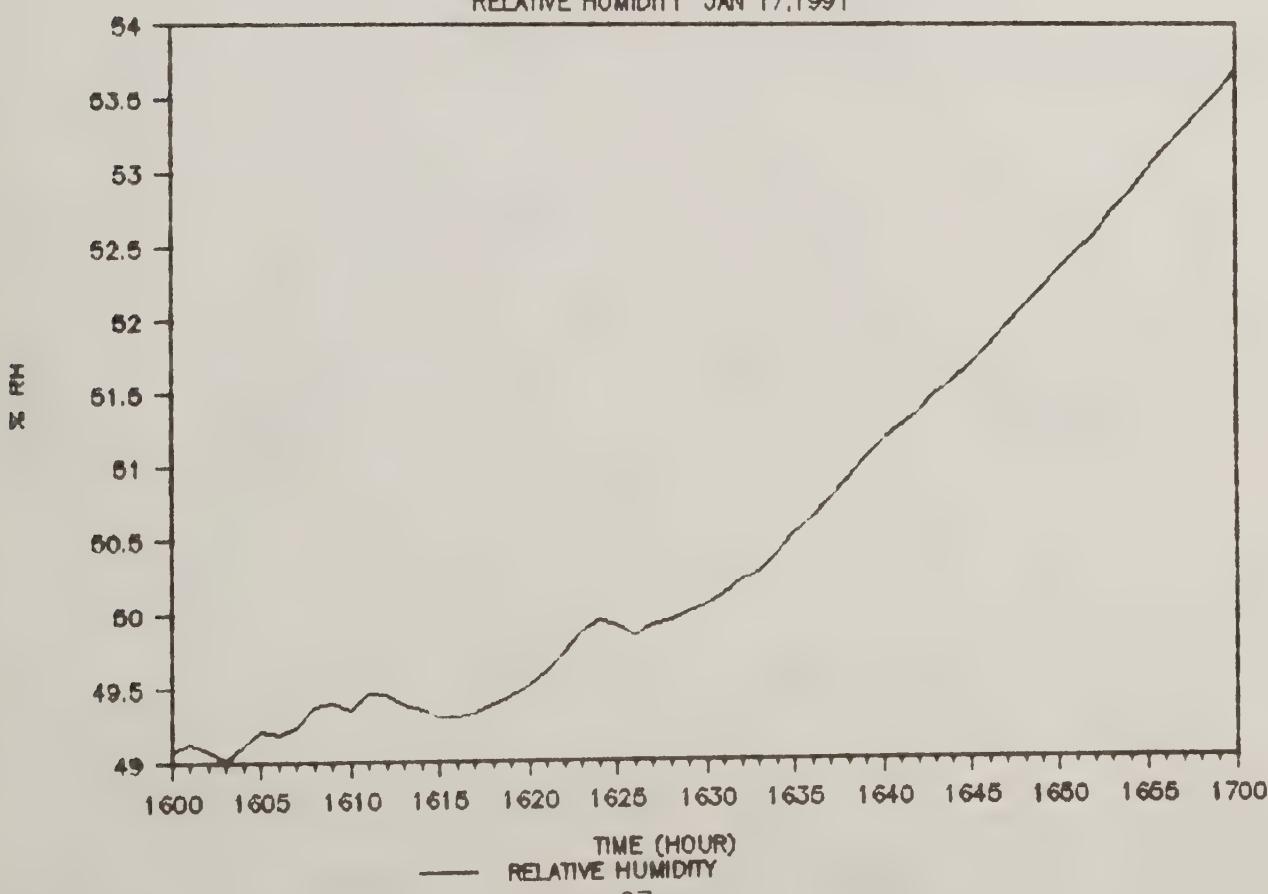
DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 17, 1991



DAVIS WEATHER DATA STN #1

RELATIVE HUMIDITY JAN 17, 1991

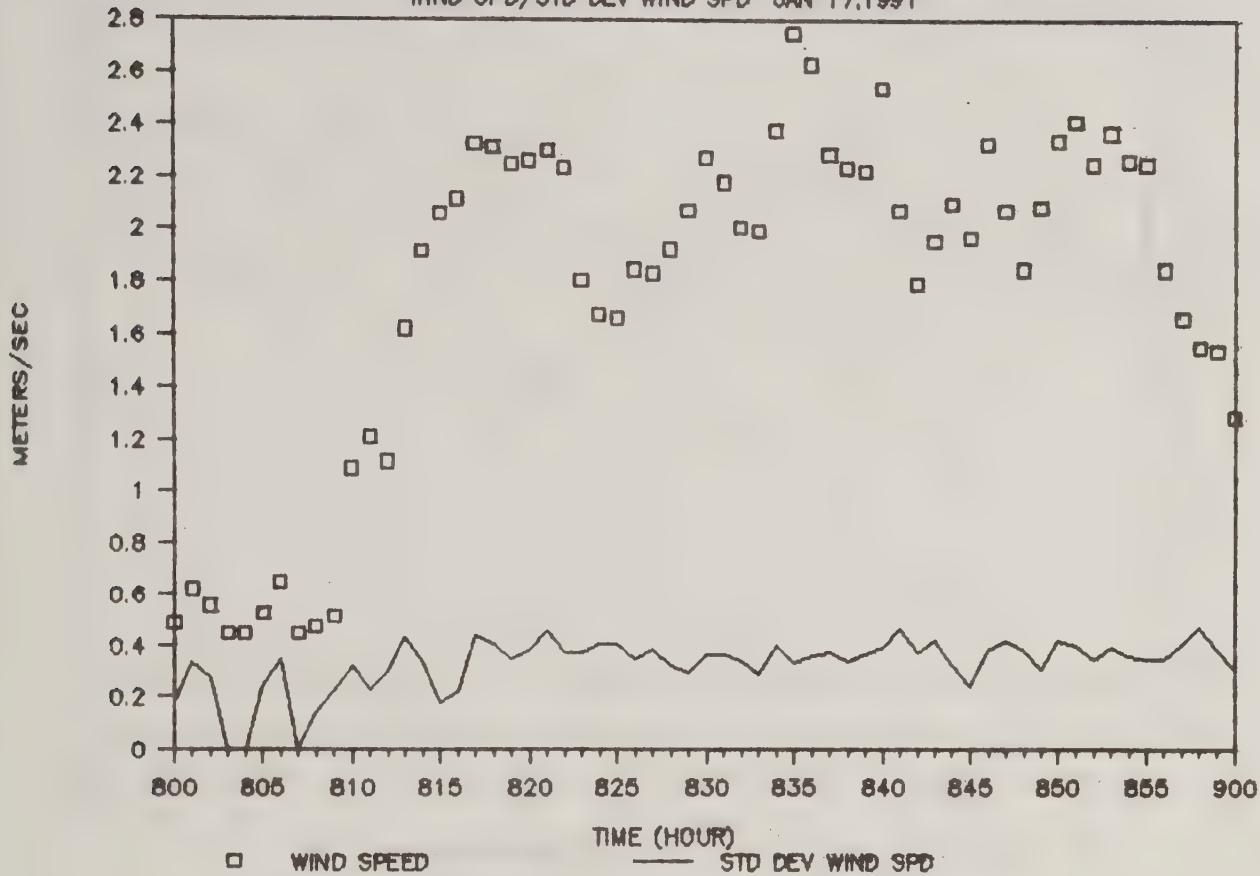


Davis Weather Data Station No. 2

January 17, 1991

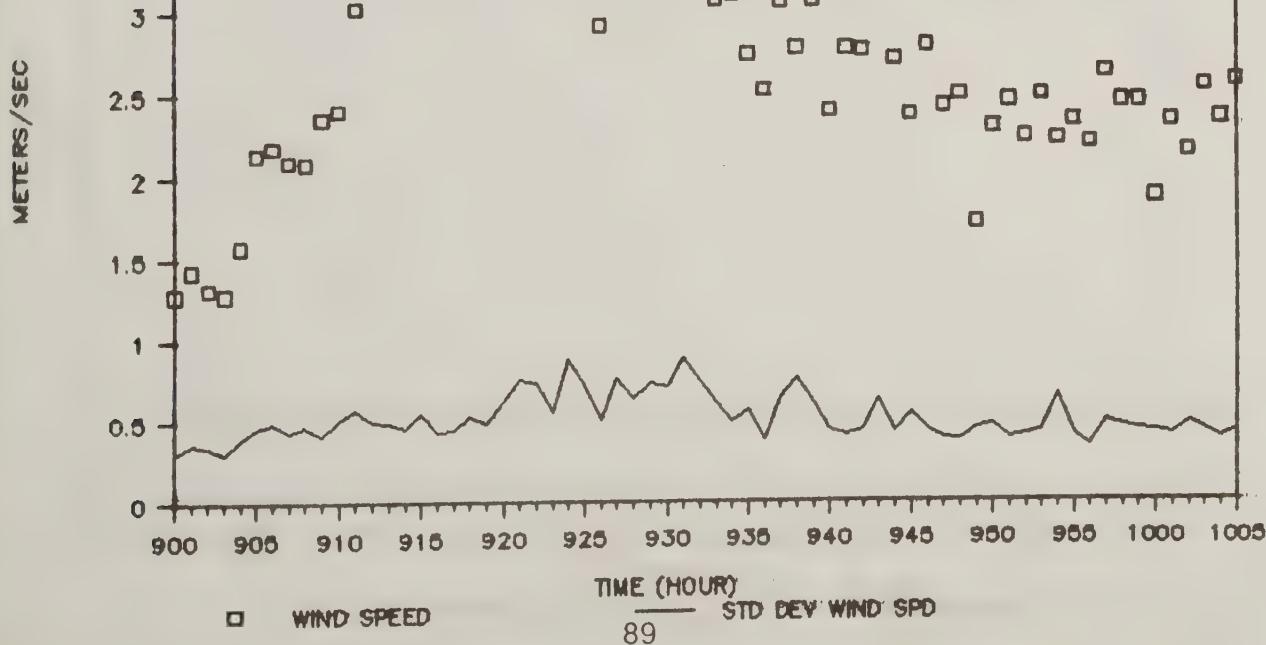
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 17, 1991



DAVIS WEATHER DATA STN #2

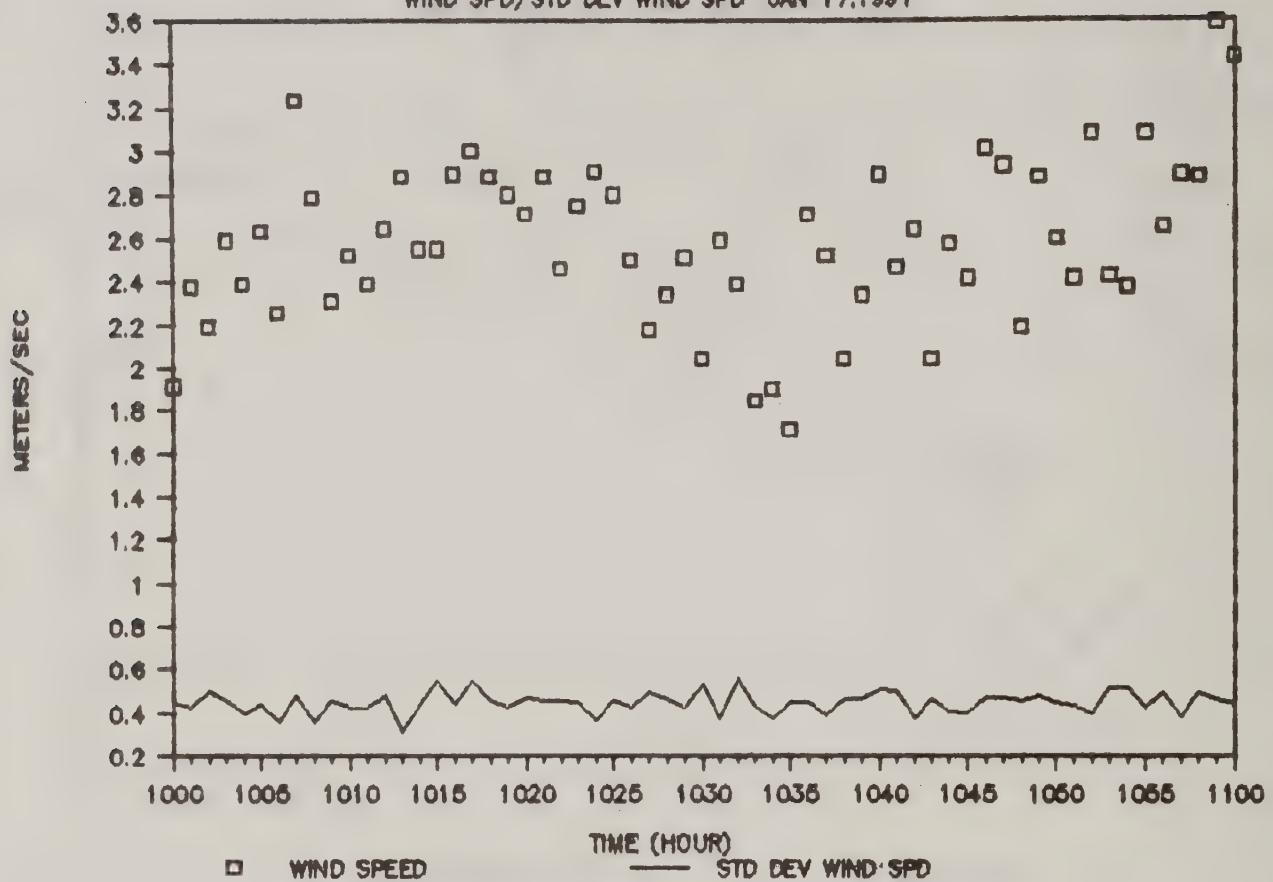
WIND SPD/STD DEV WIND SPD JAN 17, 1991



TIME (HOUR) $\overline{\text{STD DEV WIND SPD}}$

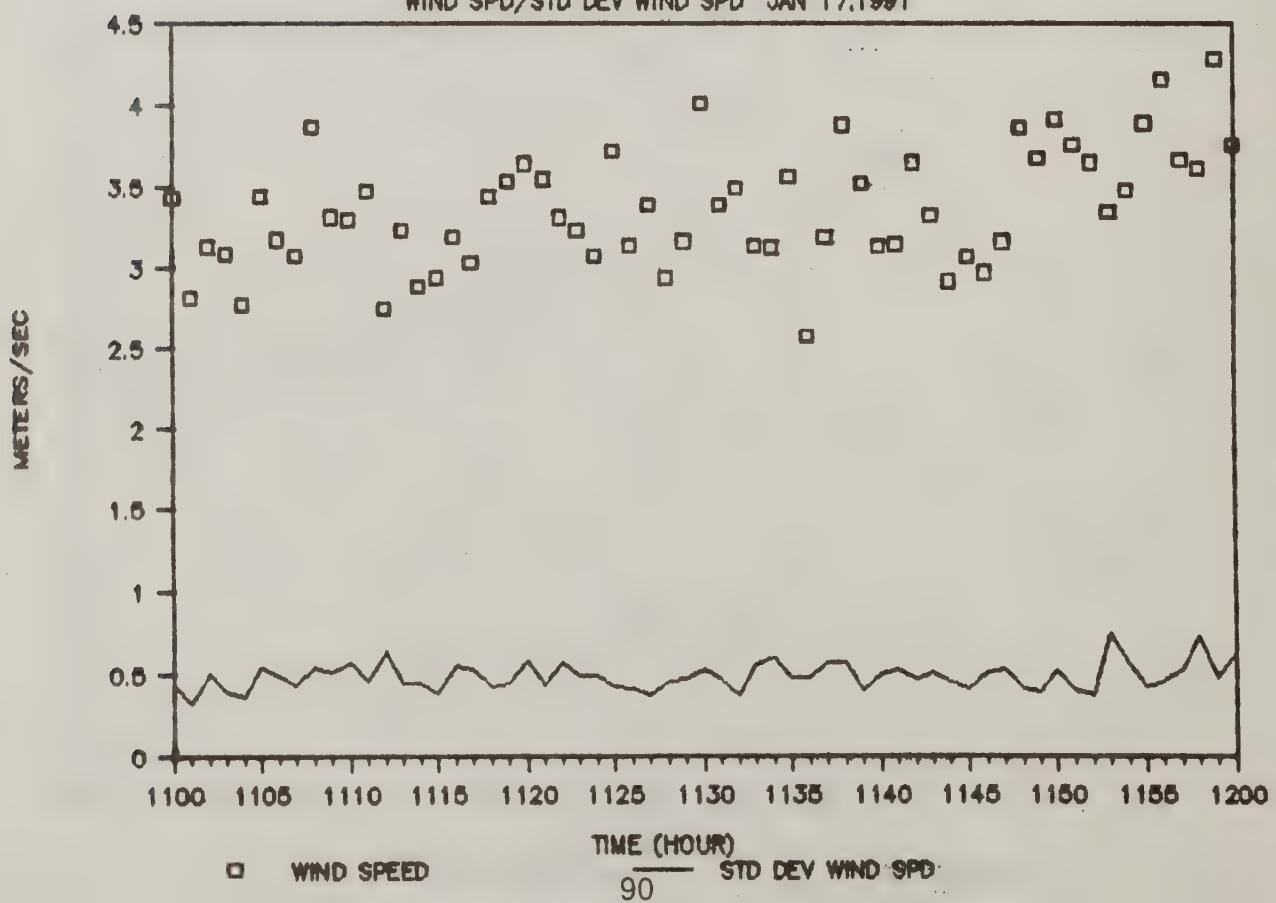
DAVIS WEATHER DATA STN. #2

WIND SPD/STD DEV WIND SPD JAN 17,1991



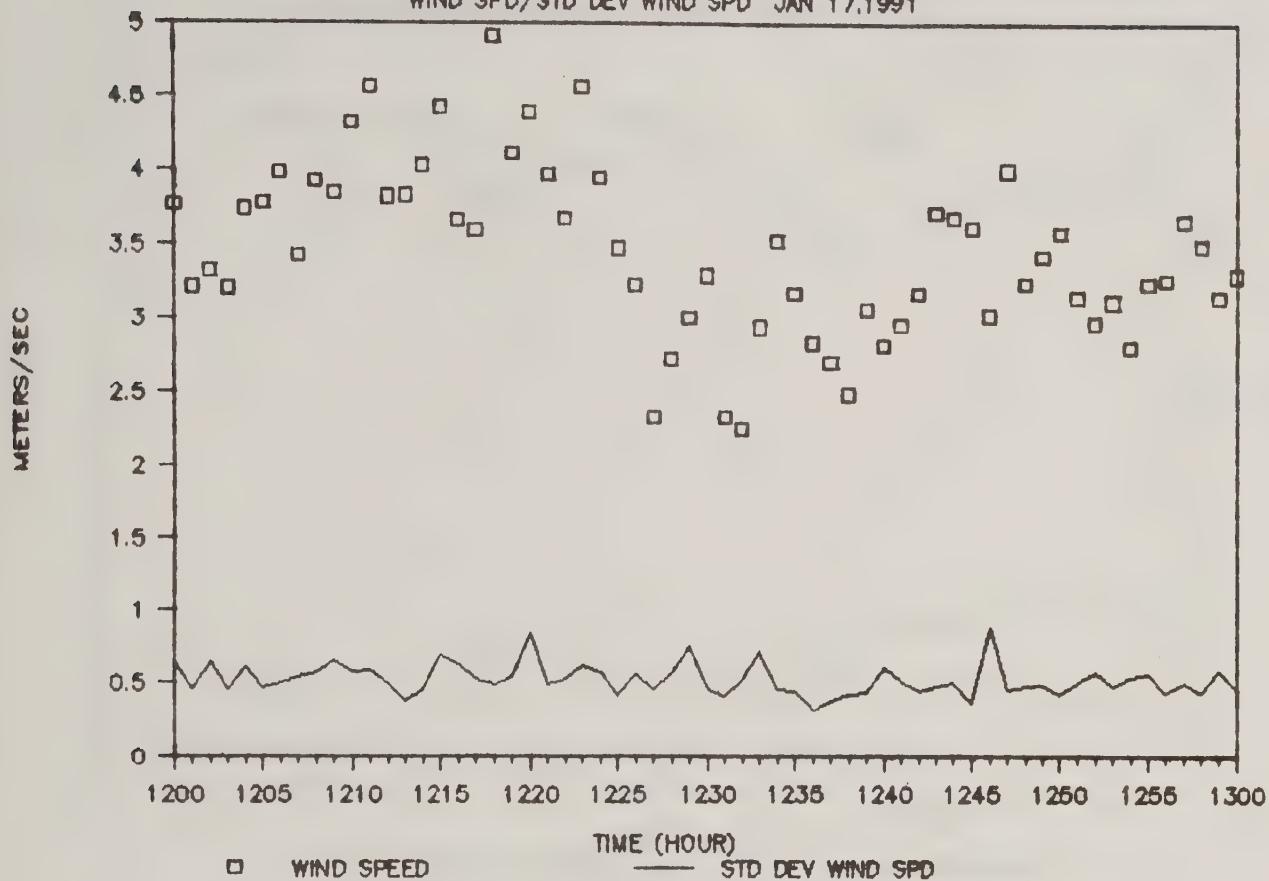
DAVIS WEATHER DATA STN. #2

WIND SPD/STD DEV WIND SPD JAN 17,1991



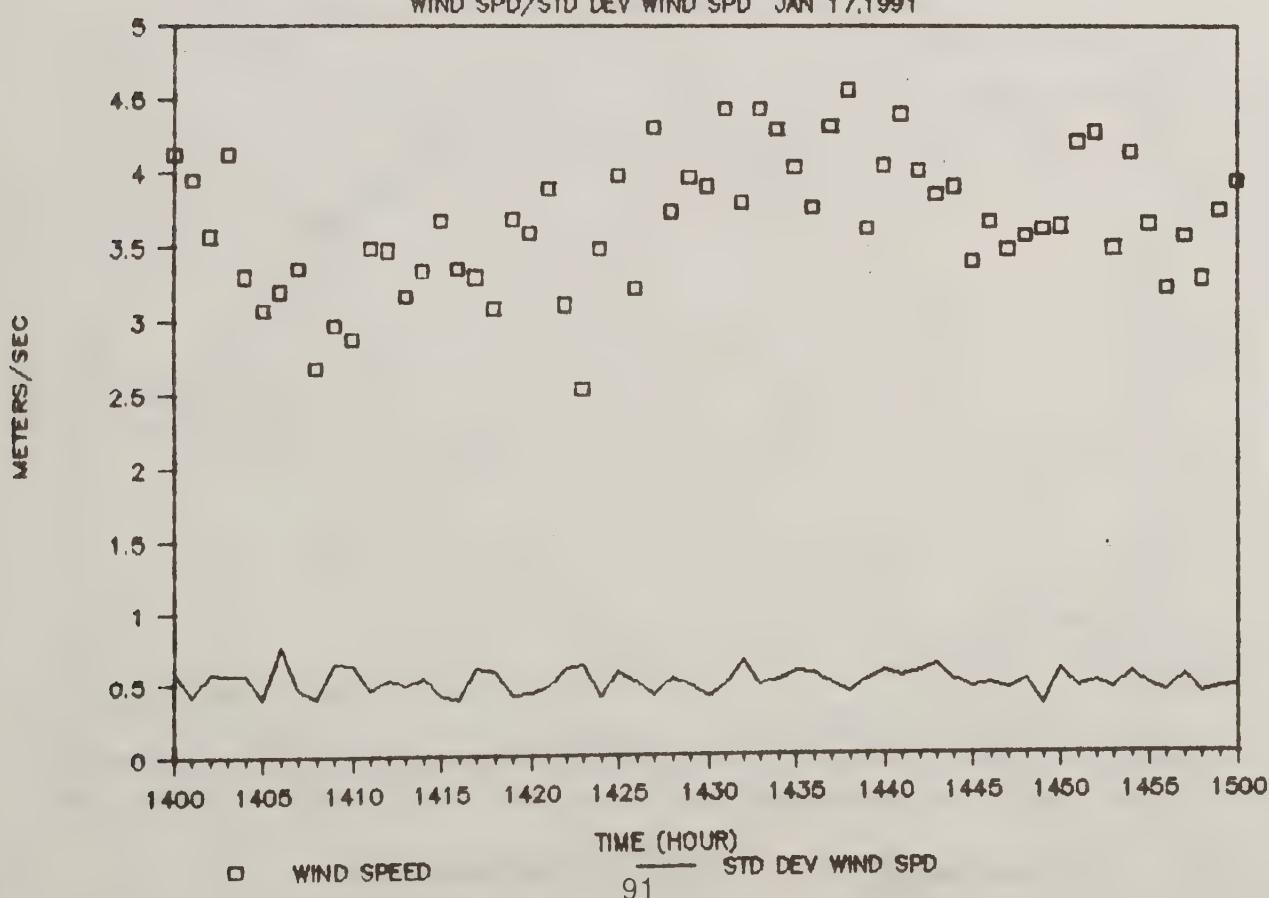
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 17,1991



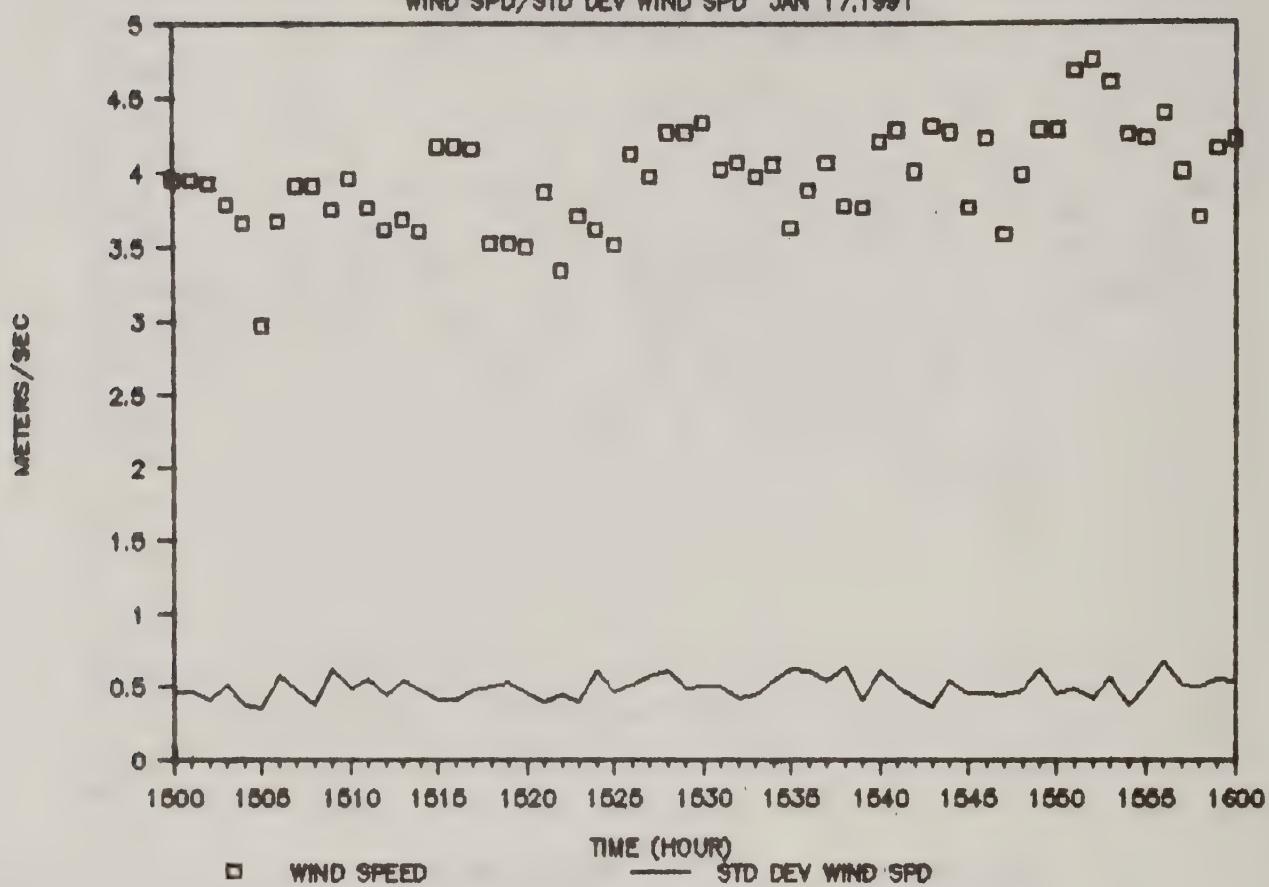
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 17,1991



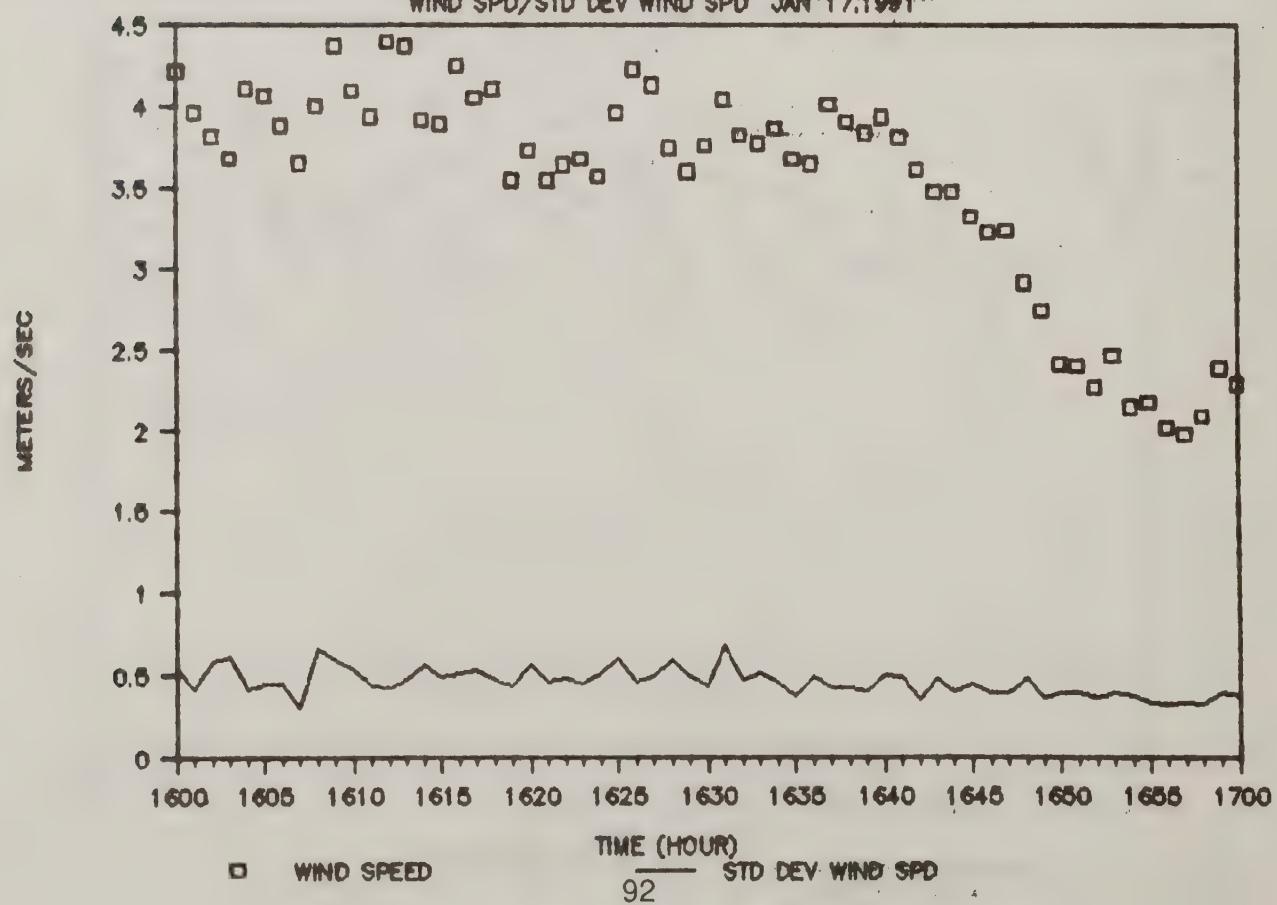
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 17,1991



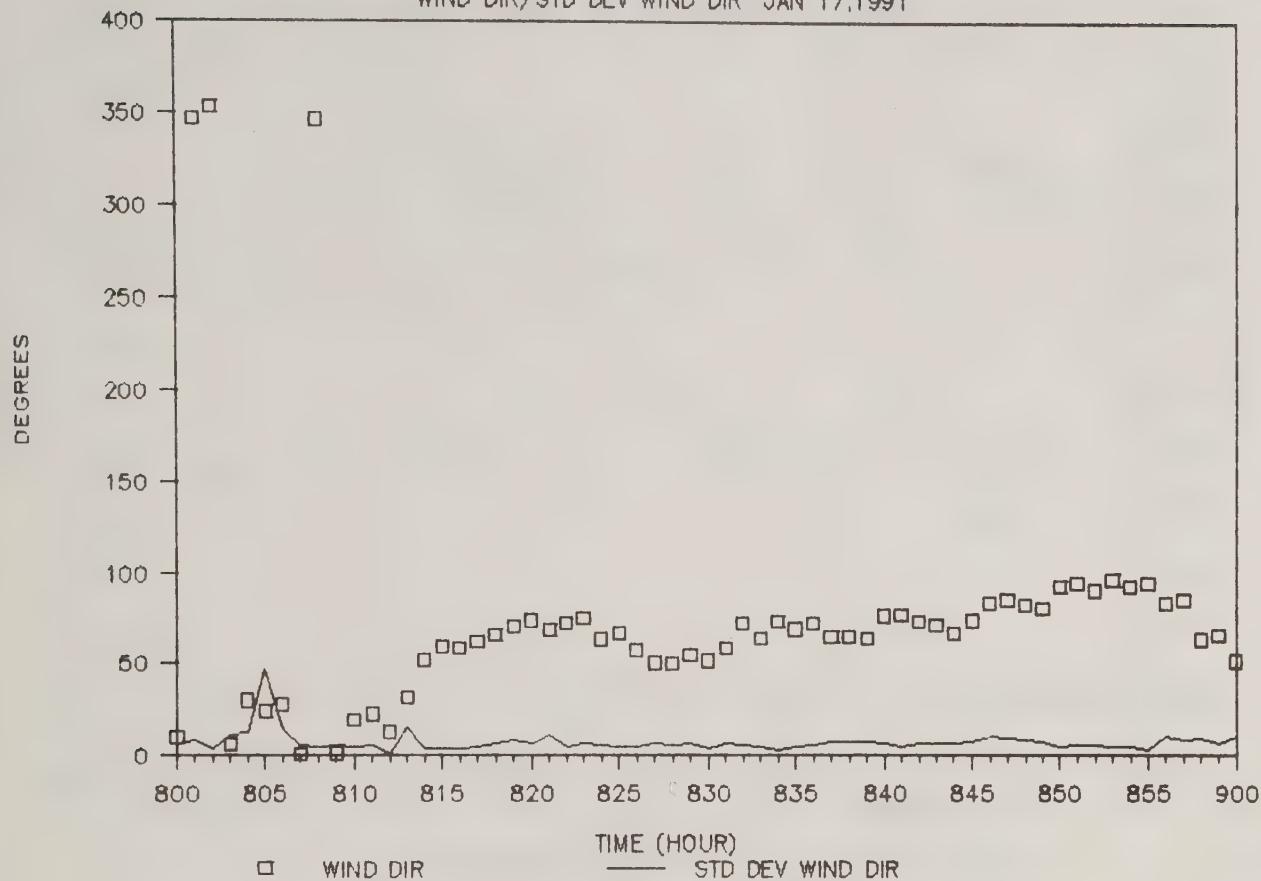
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 17,1991



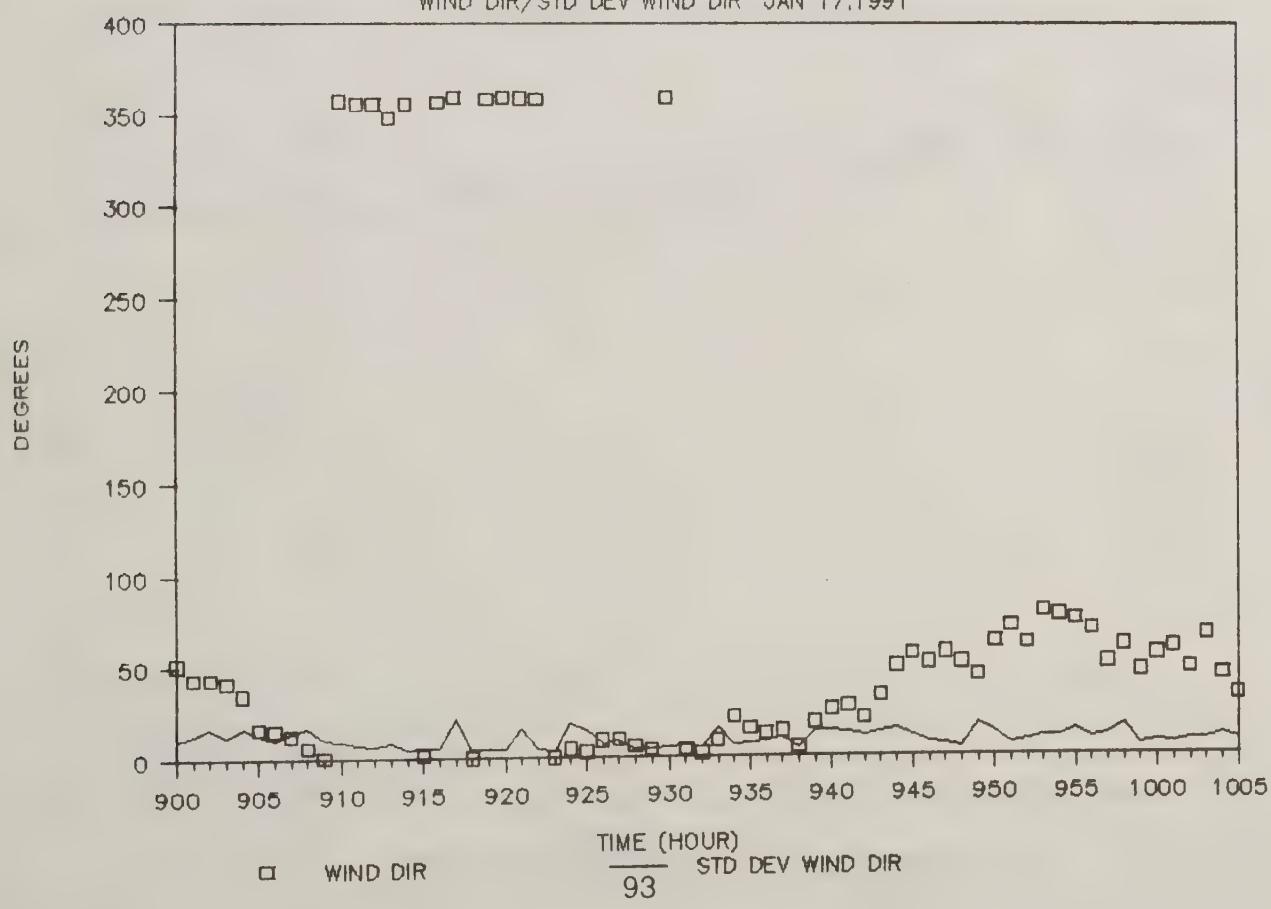
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 17,1991



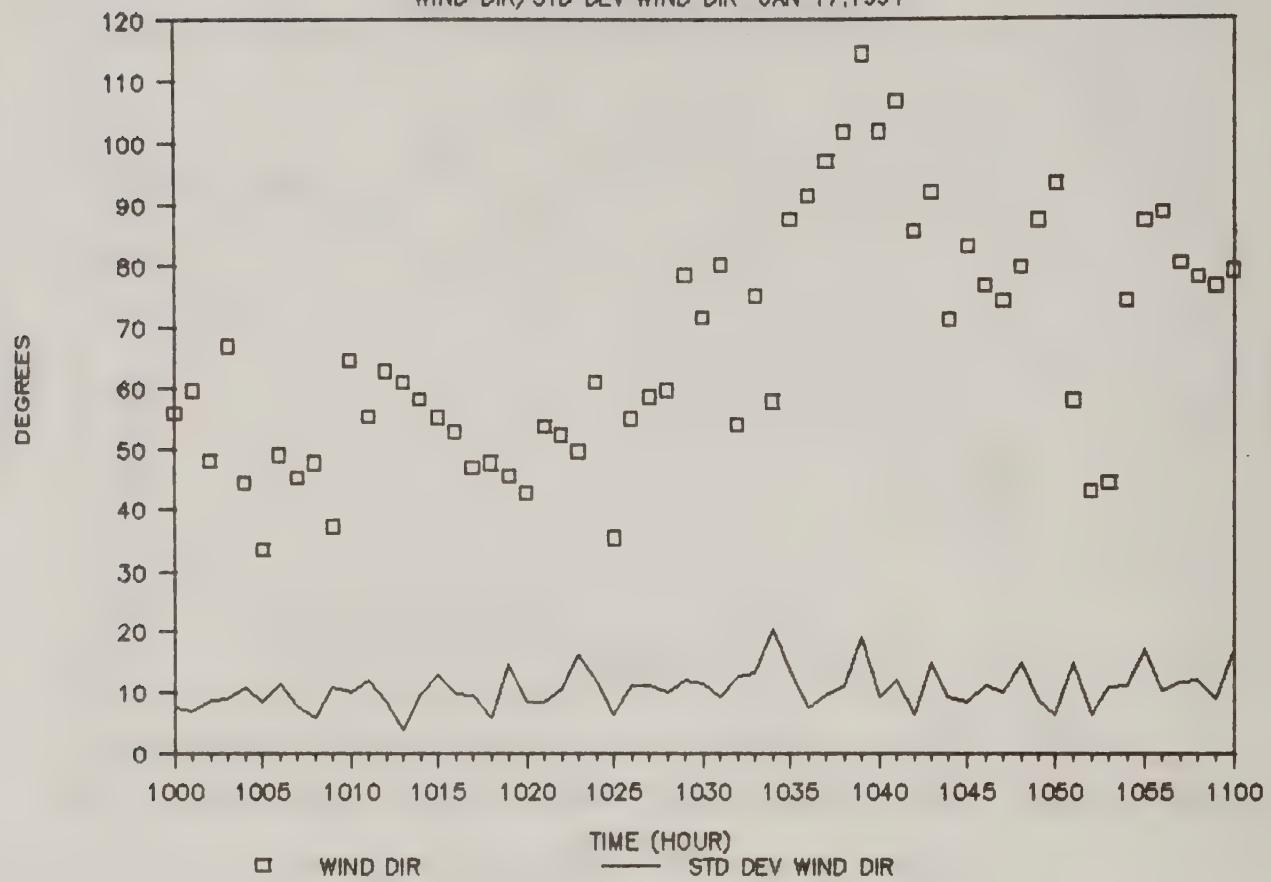
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 17,1991



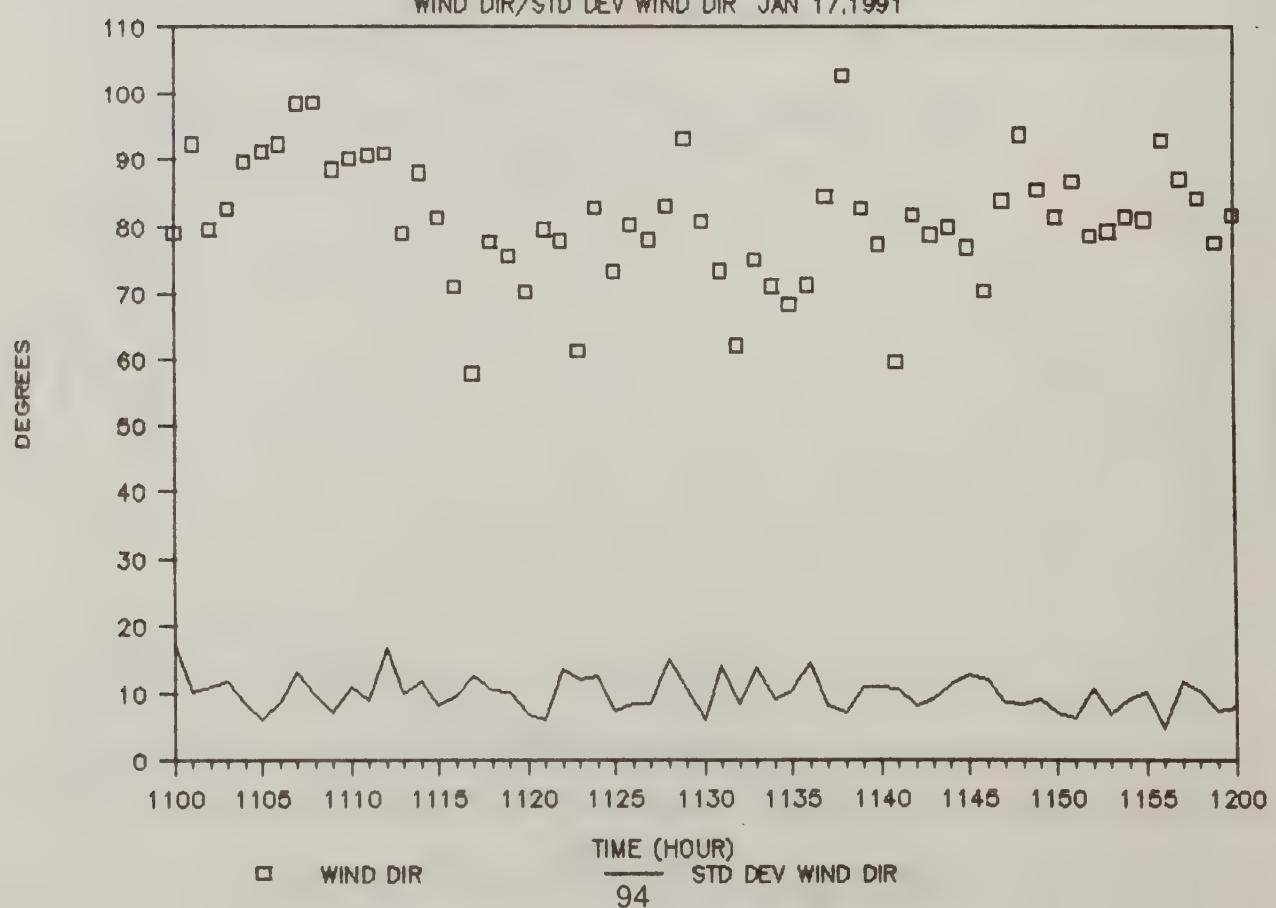
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 17,1991



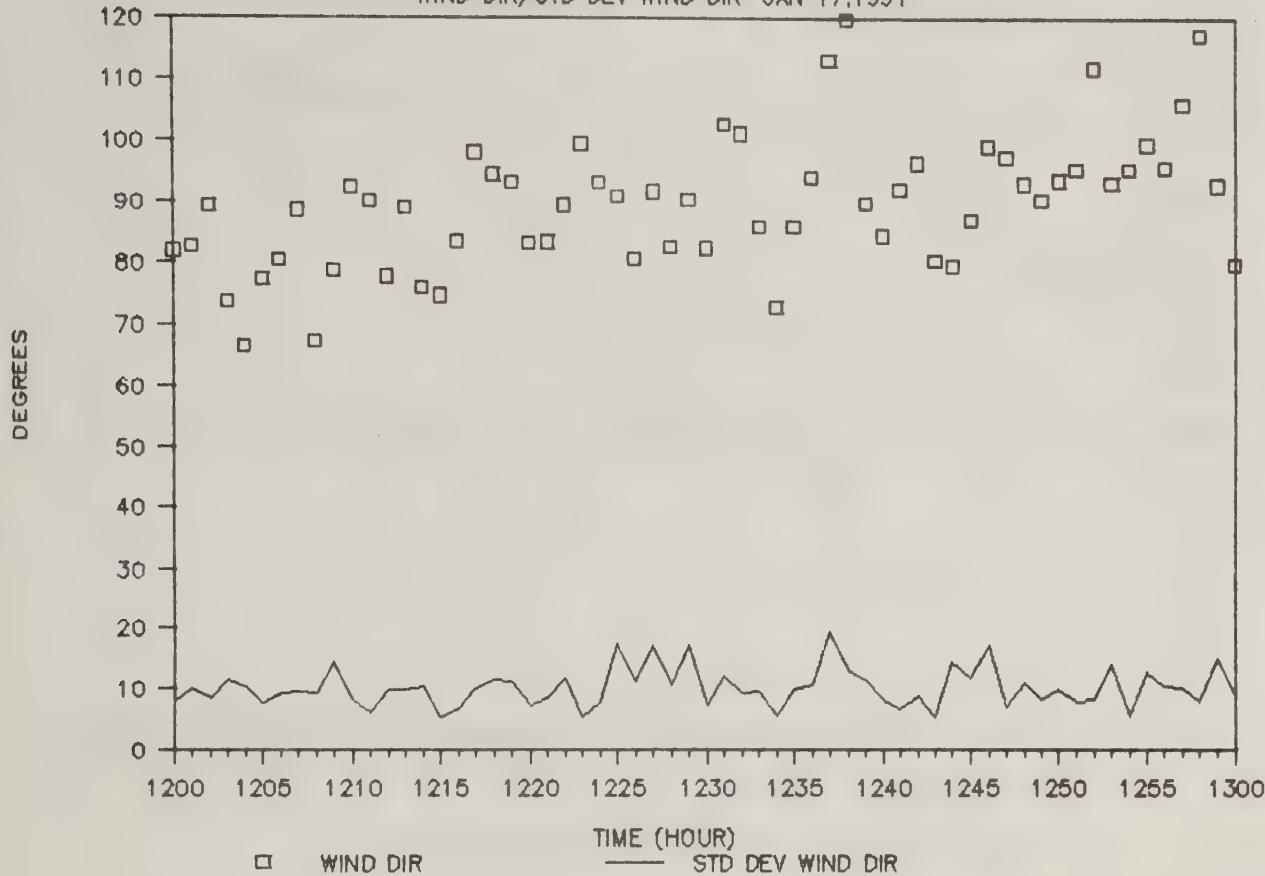
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 17,1991



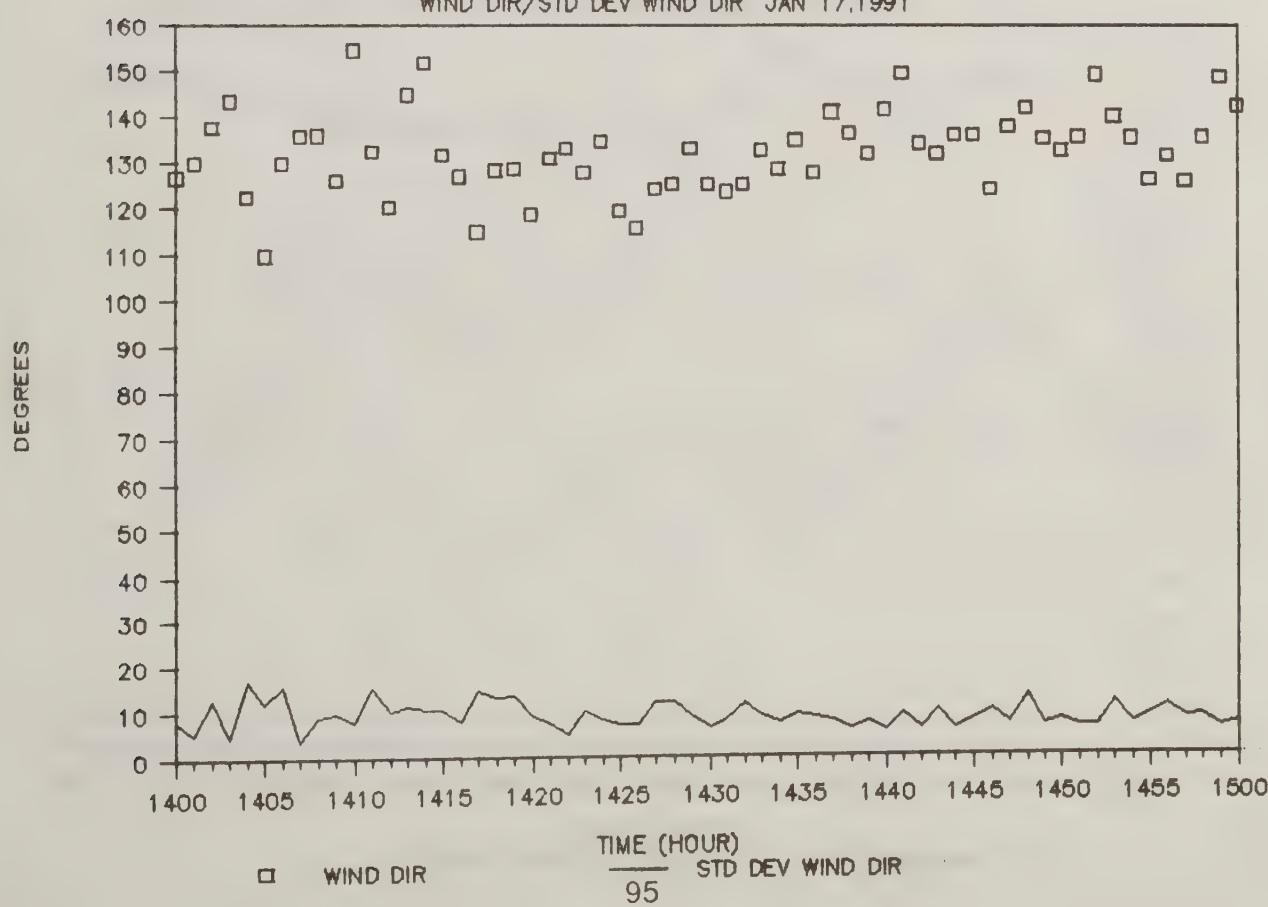
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 17,1991



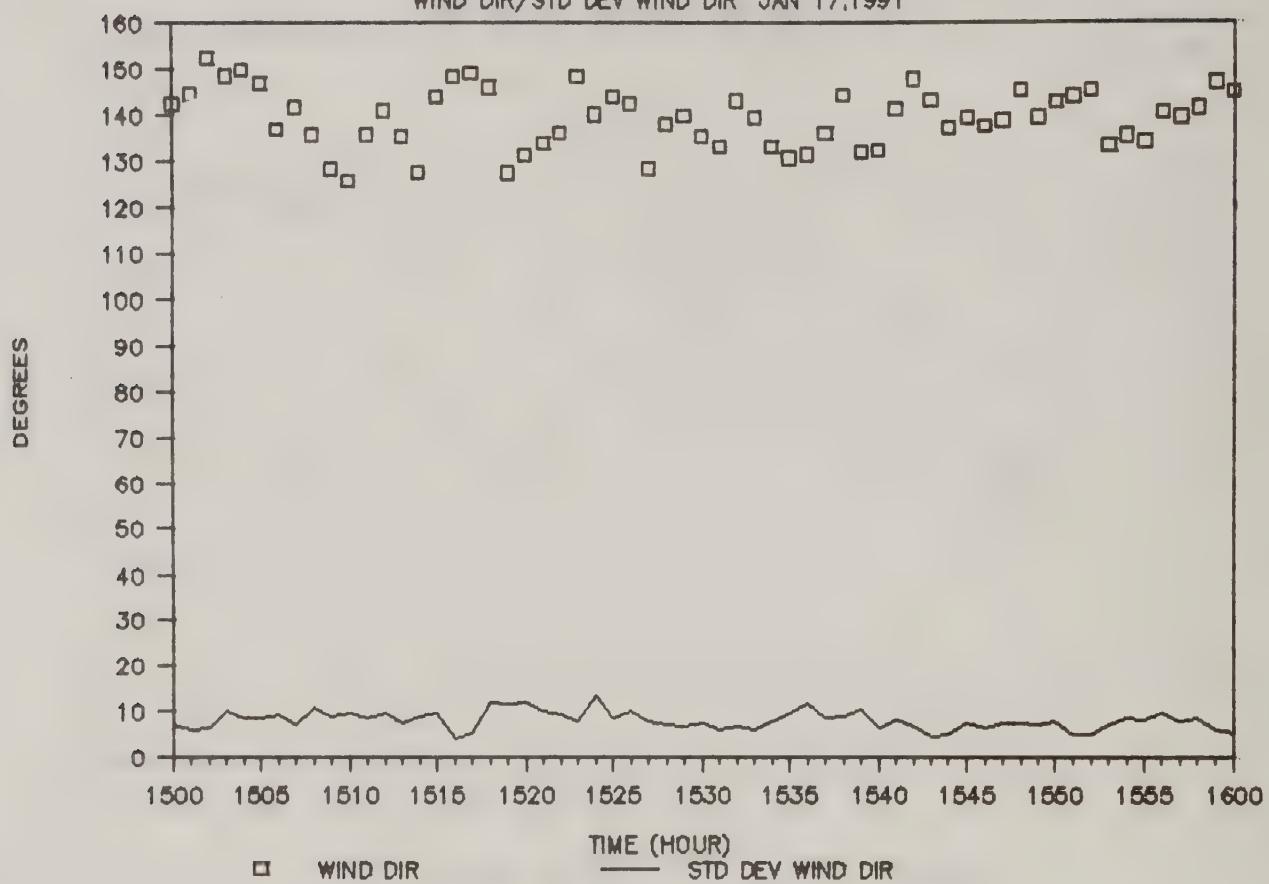
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 17,1991



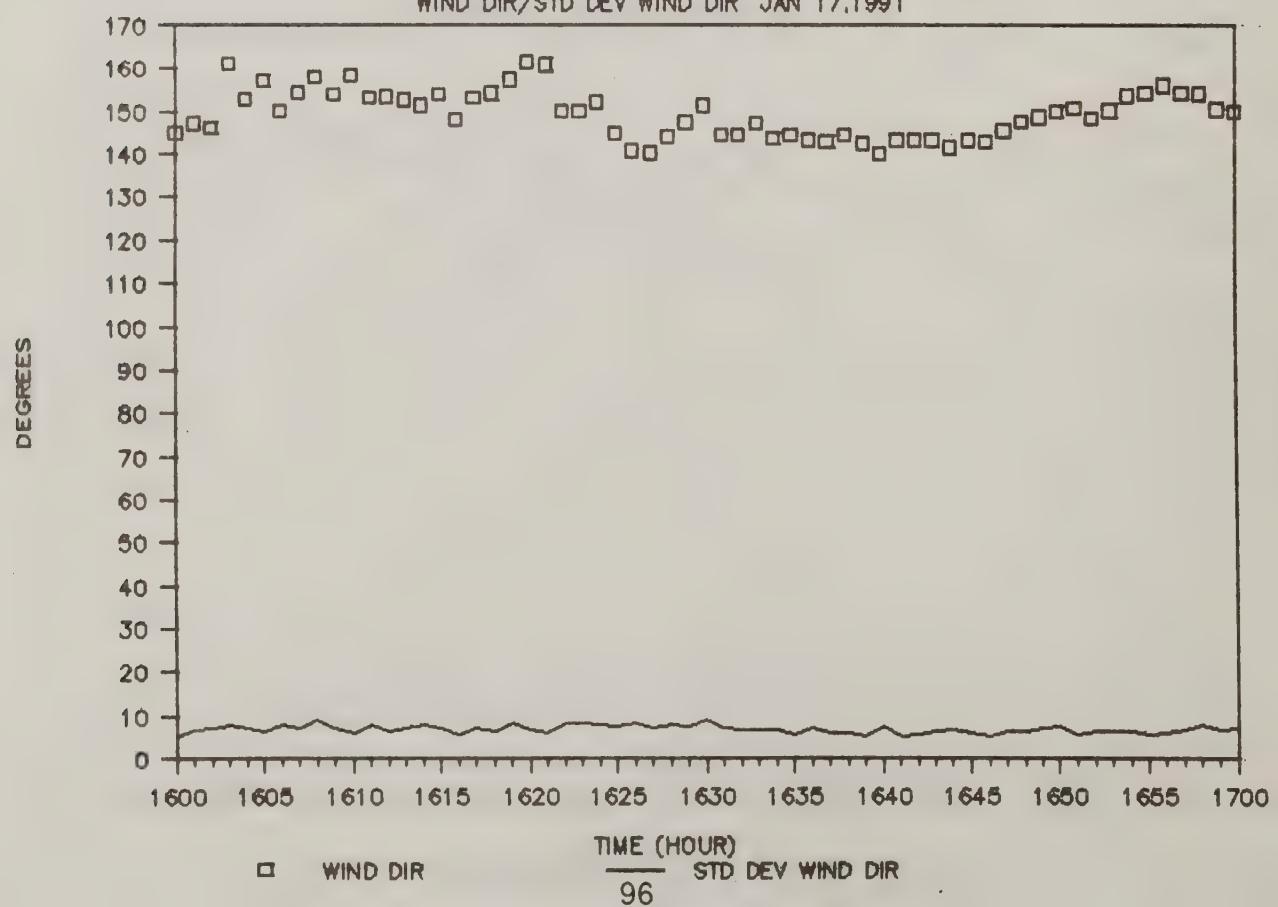
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 17,1991



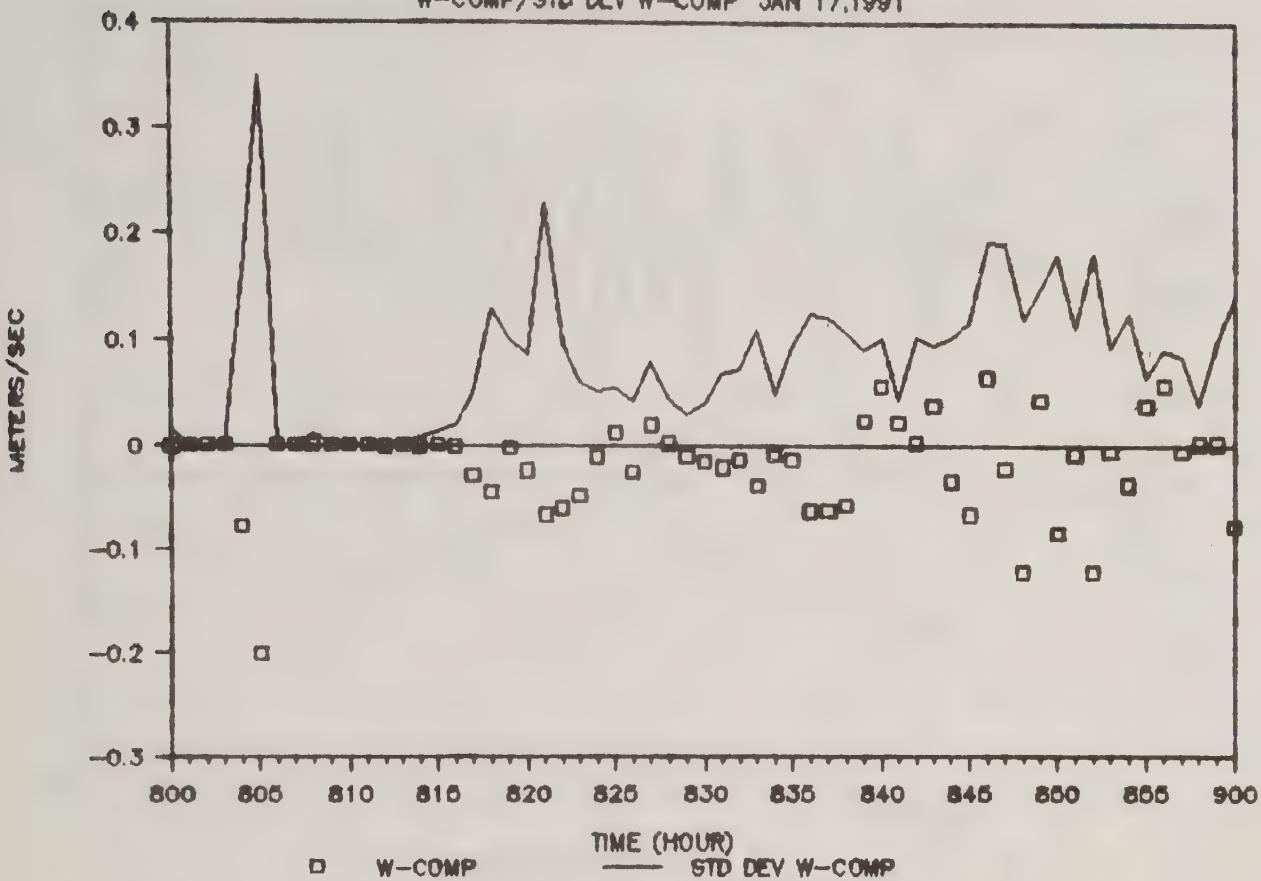
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 17,1991



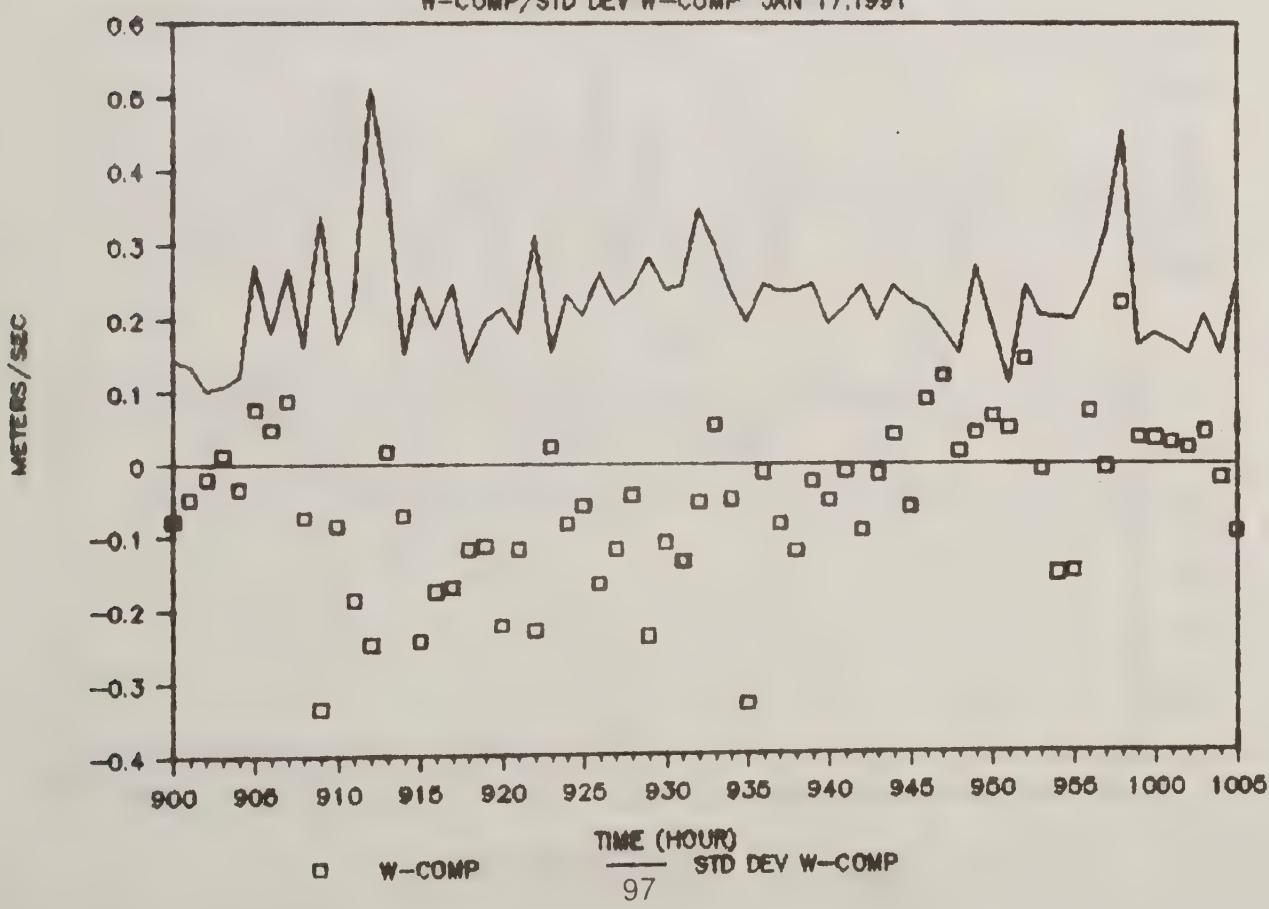
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 17, 1991



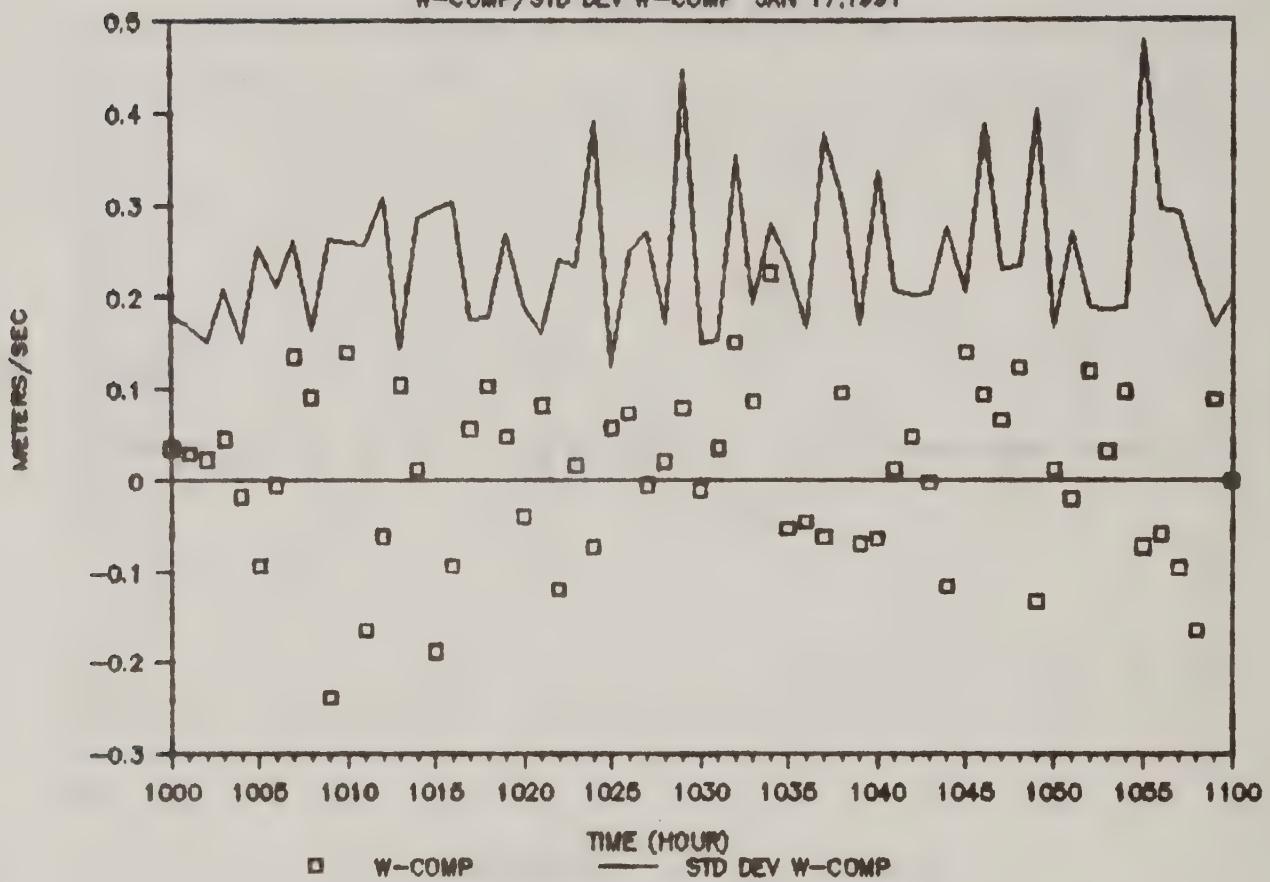
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 17, 1991



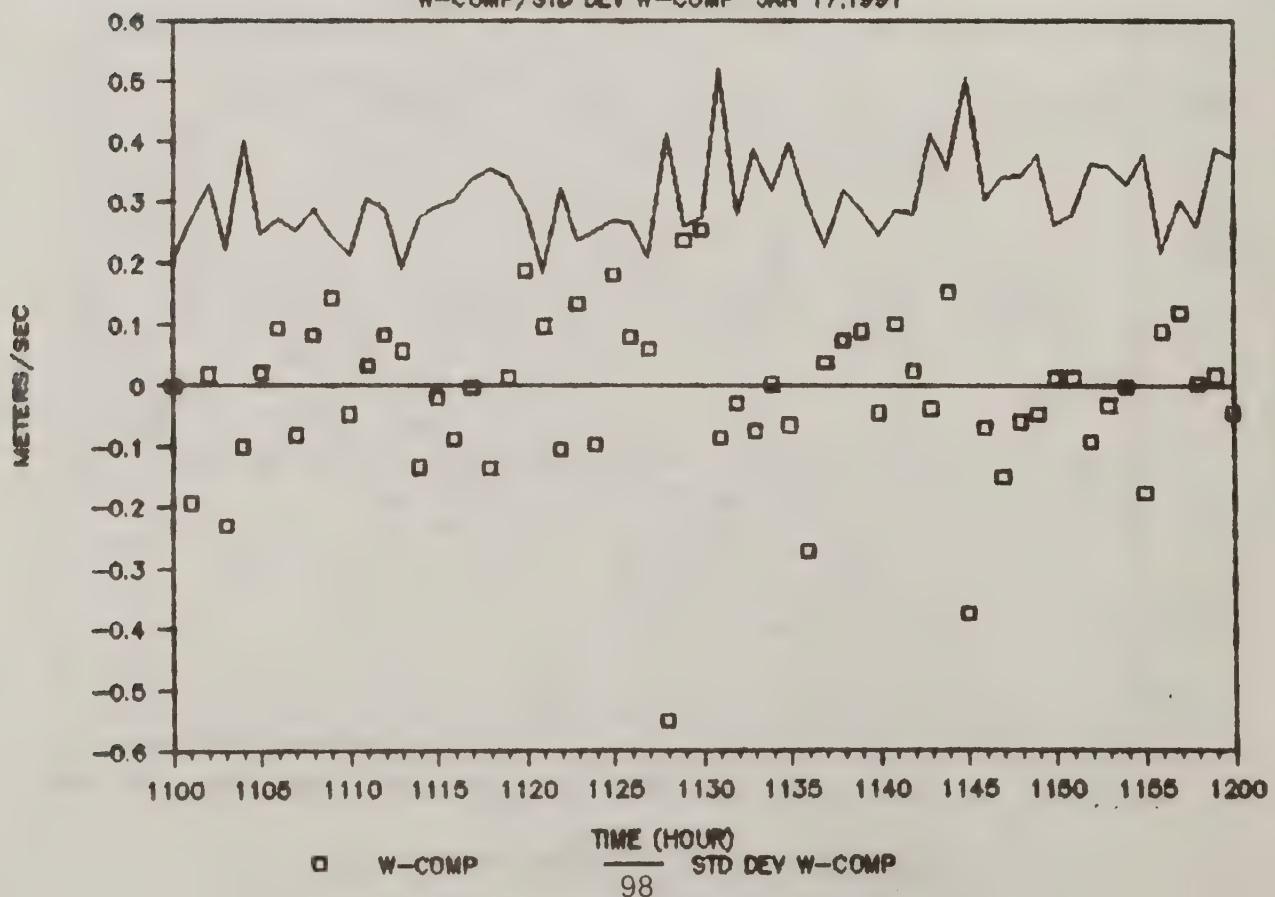
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 17,1991



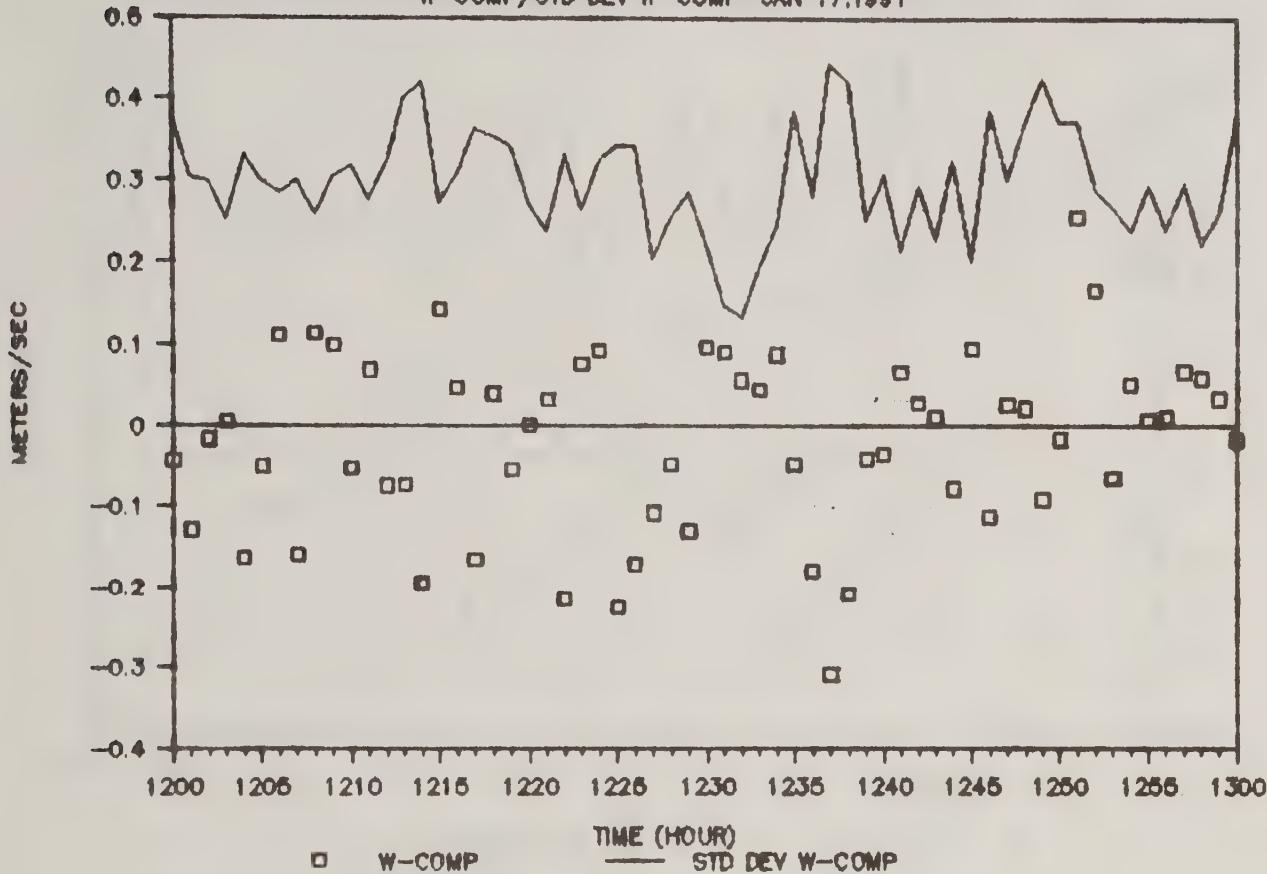
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 17,1991



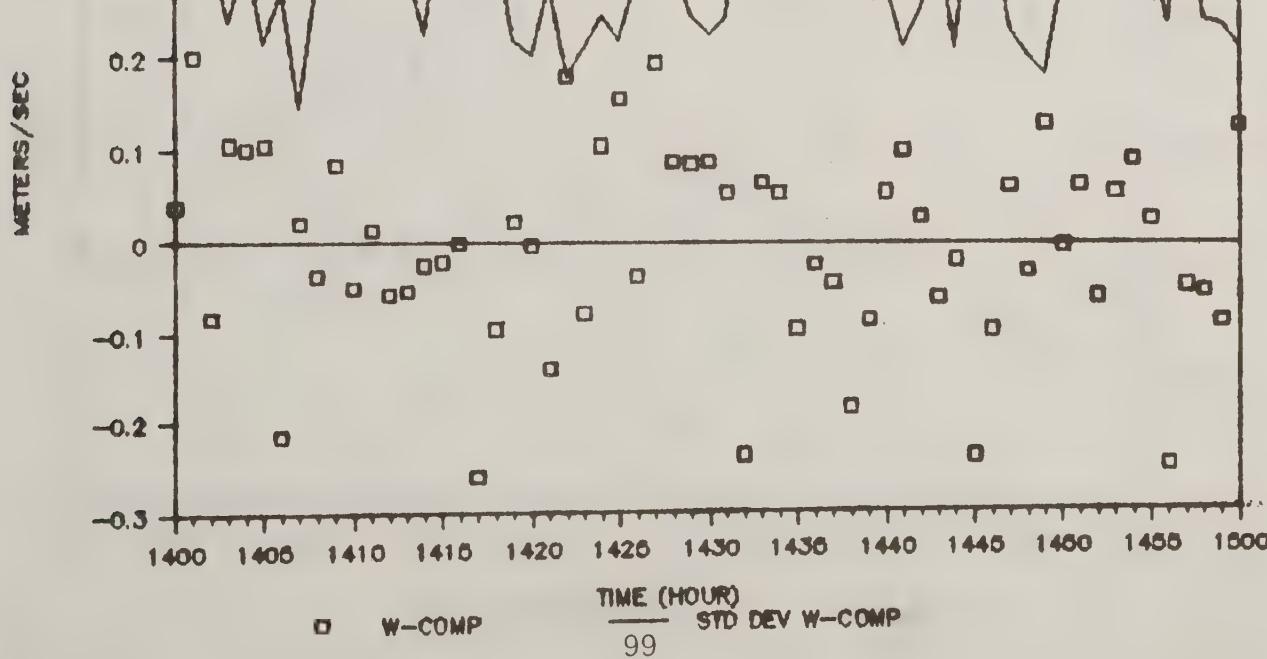
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 17,1991



DAVIS WEATHER DATA STN #2

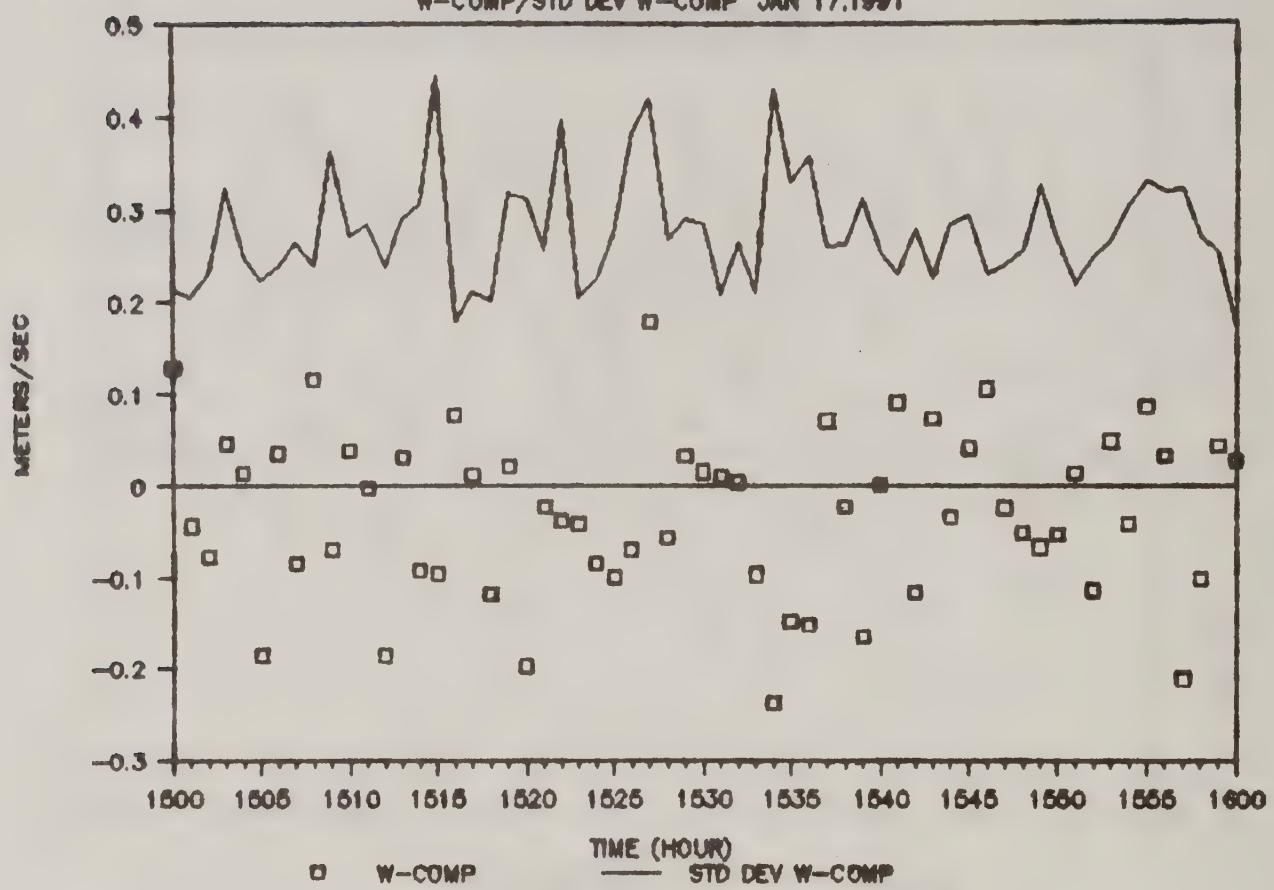
W-COMP/STD DEV W-COMP JAN 17,1991



TIME (HOUR)

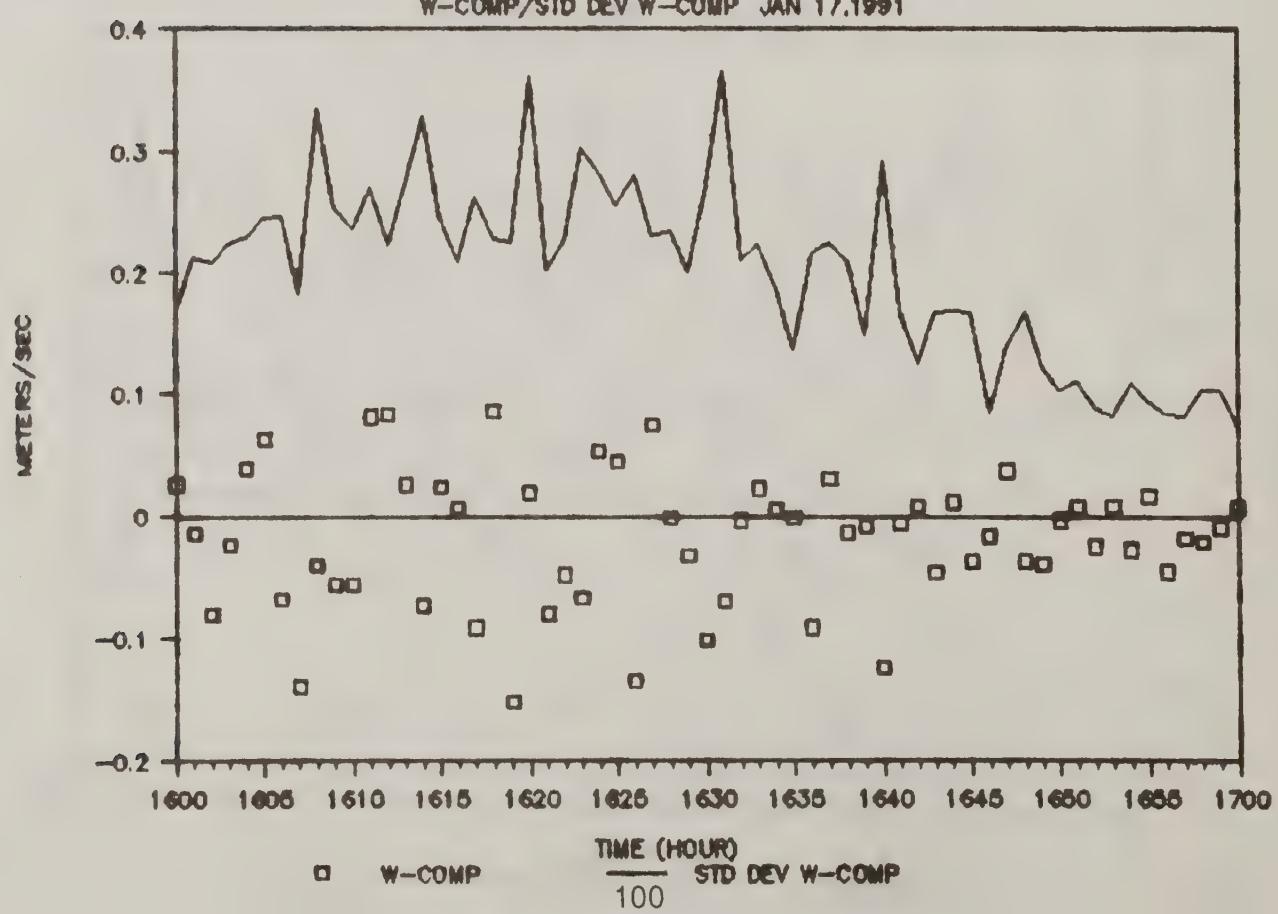
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 17,1991



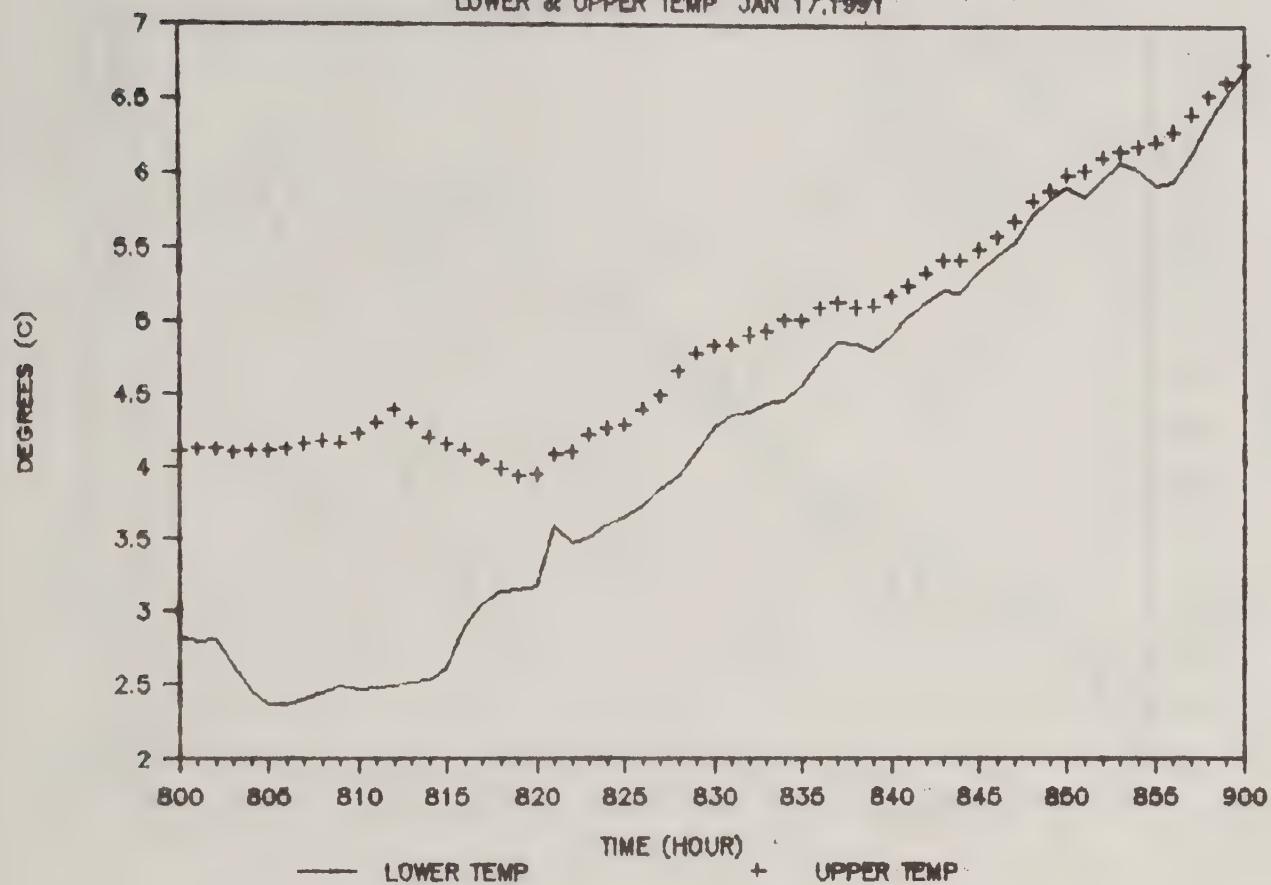
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 17,1991



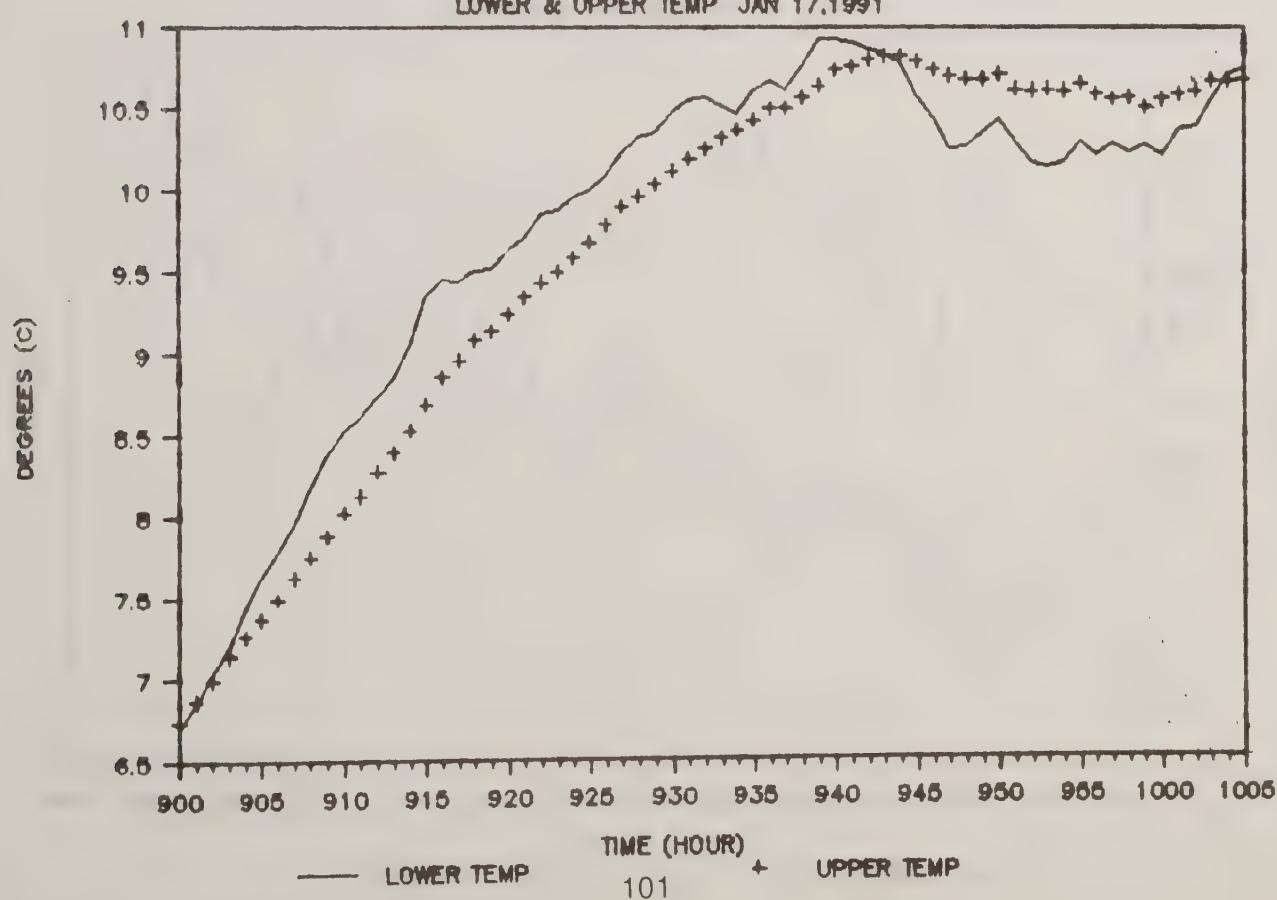
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 17, 1991



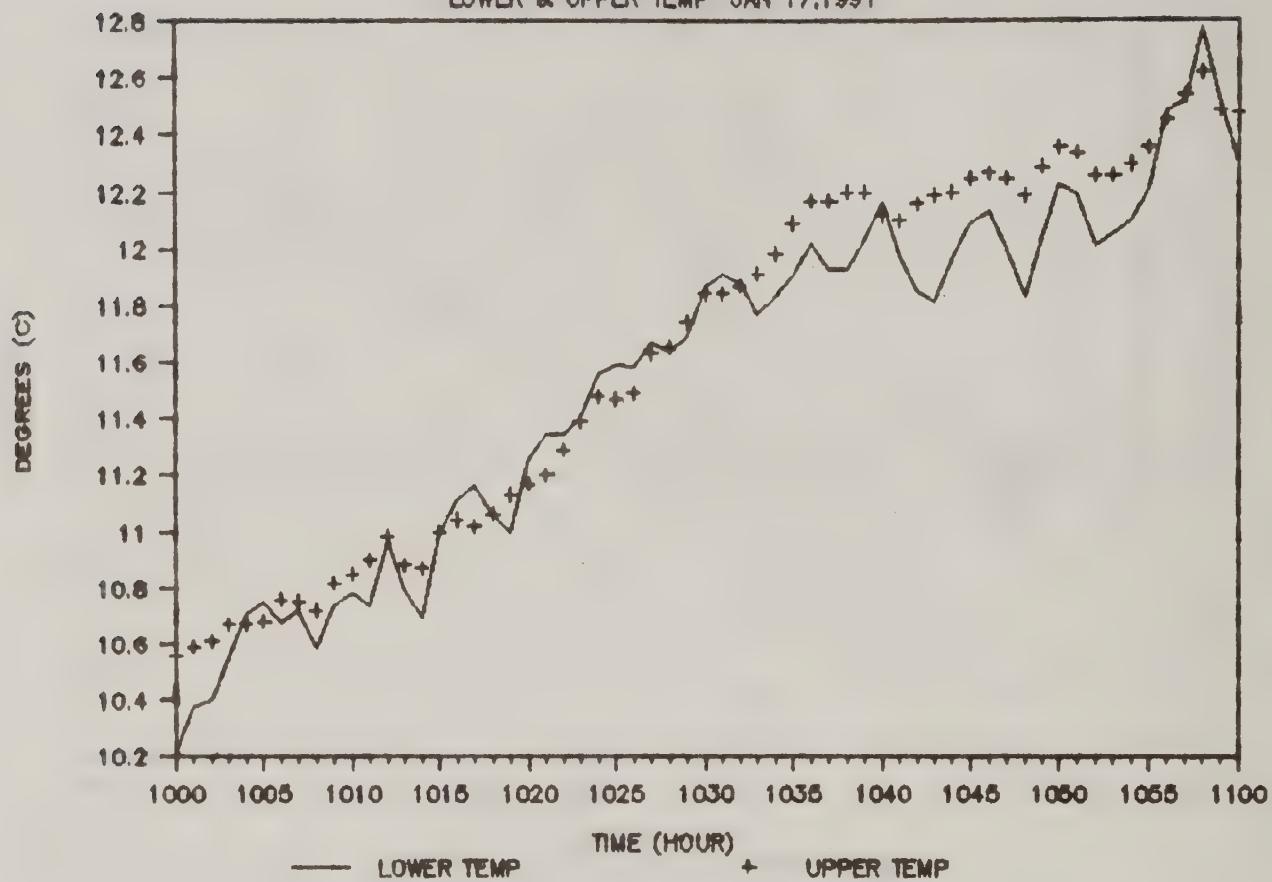
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 17, 1991



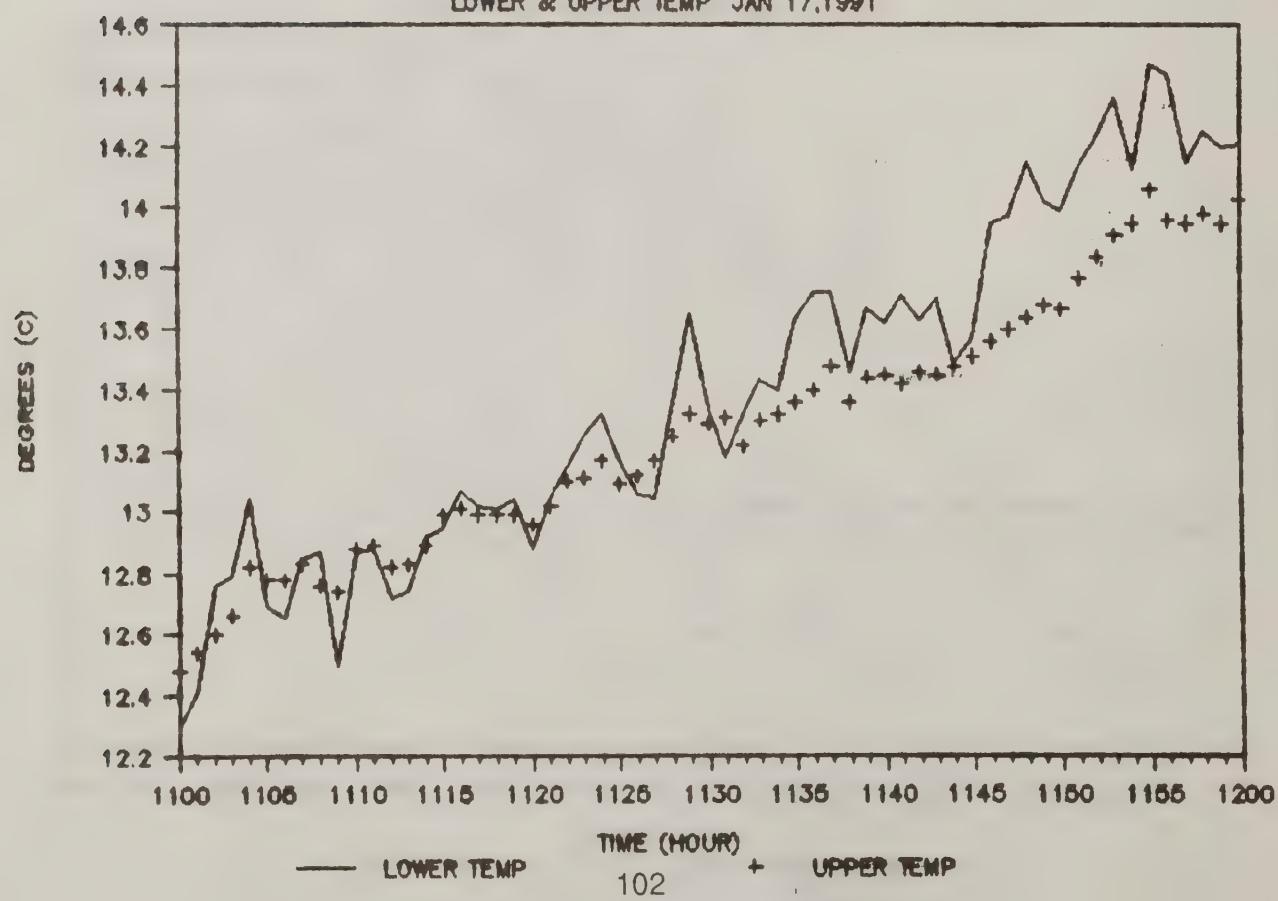
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 17,1991



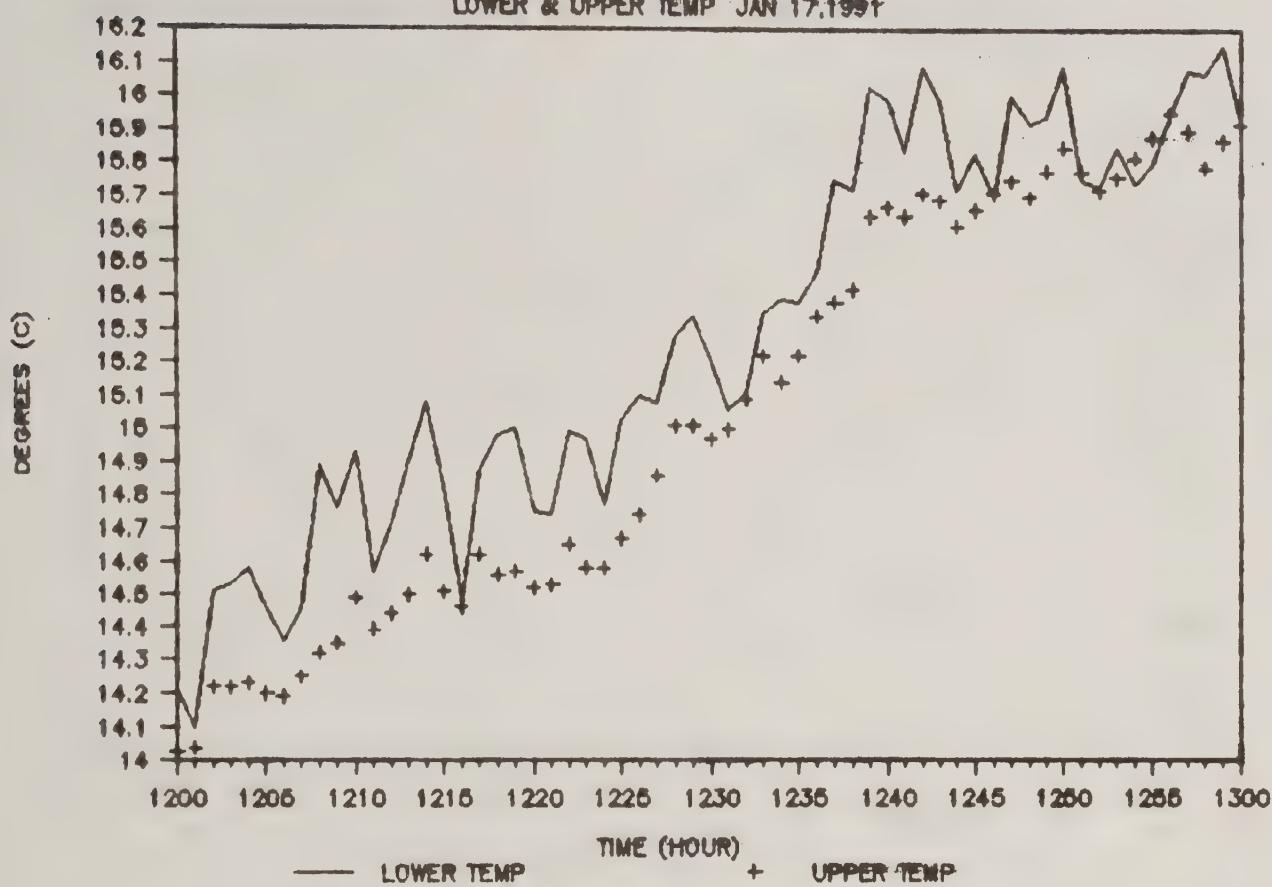
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 17,1991



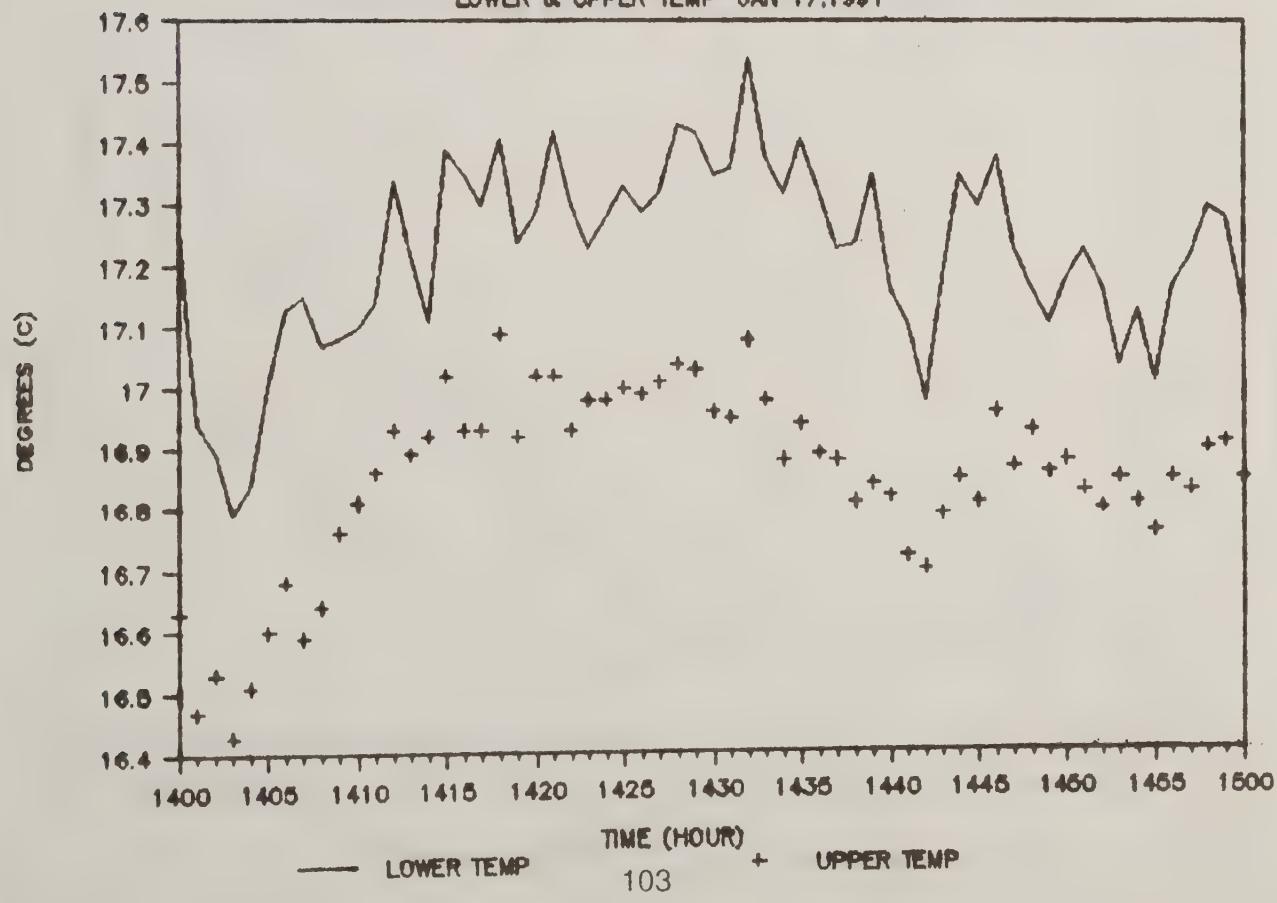
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 17, 1991



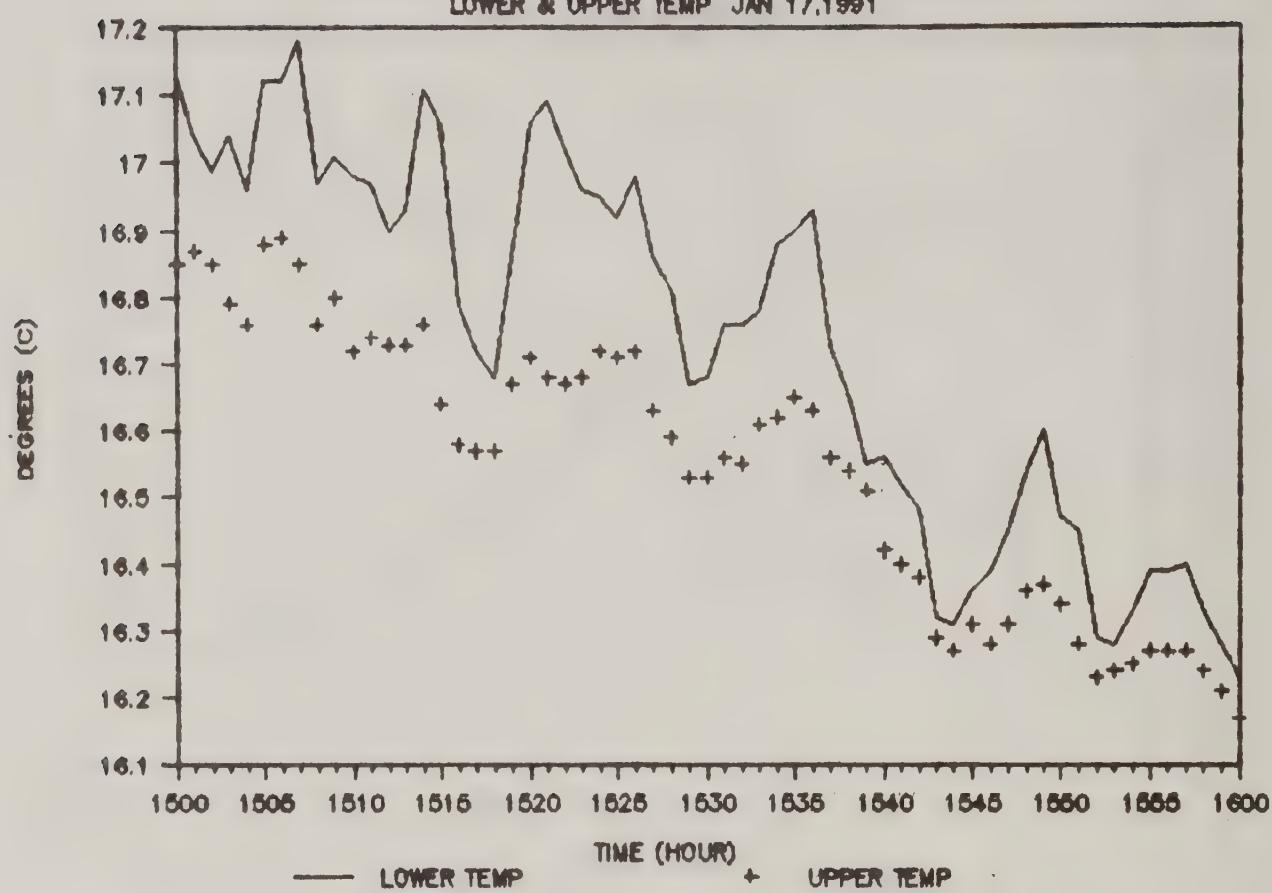
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 17, 1991



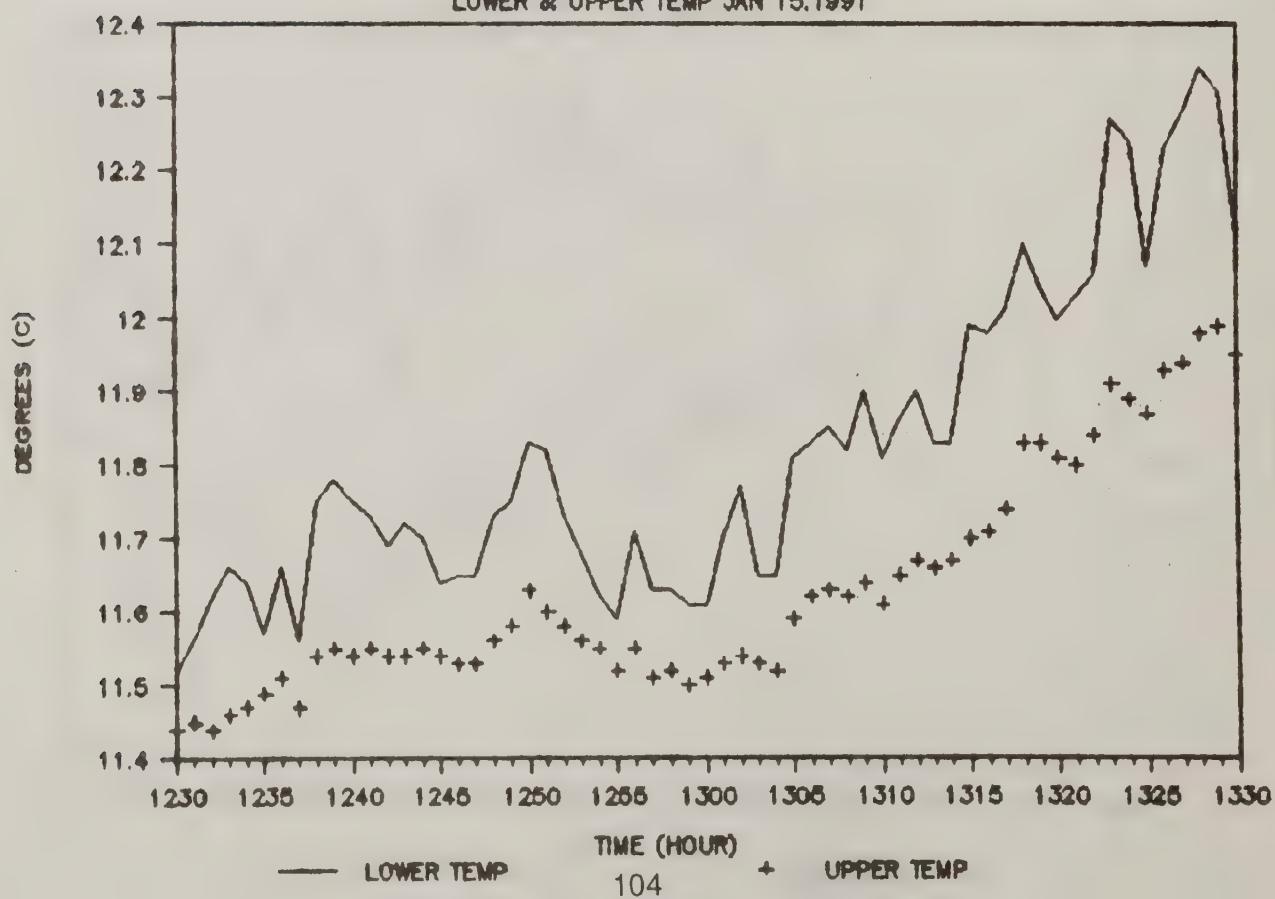
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 17, 1991



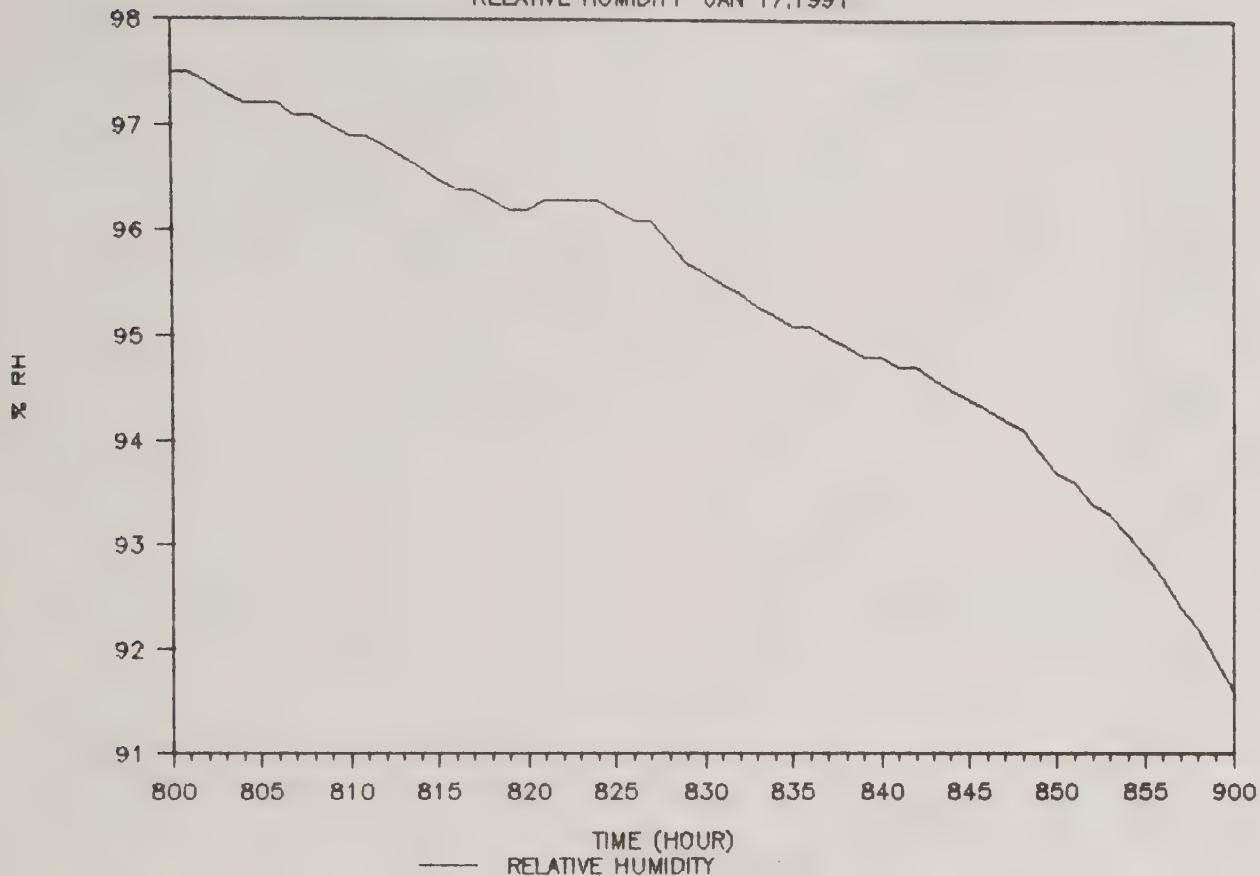
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 15, 1991



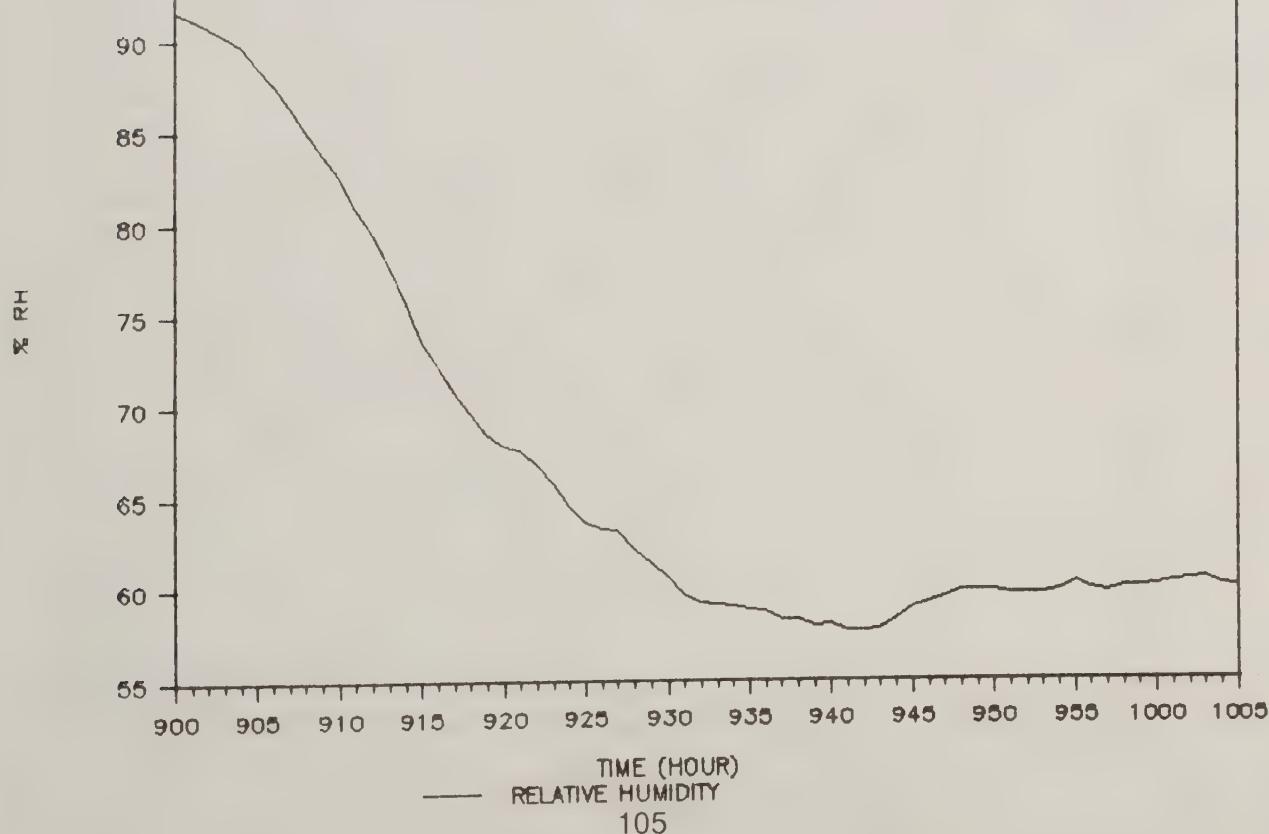
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 17,1991



DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 17,1991



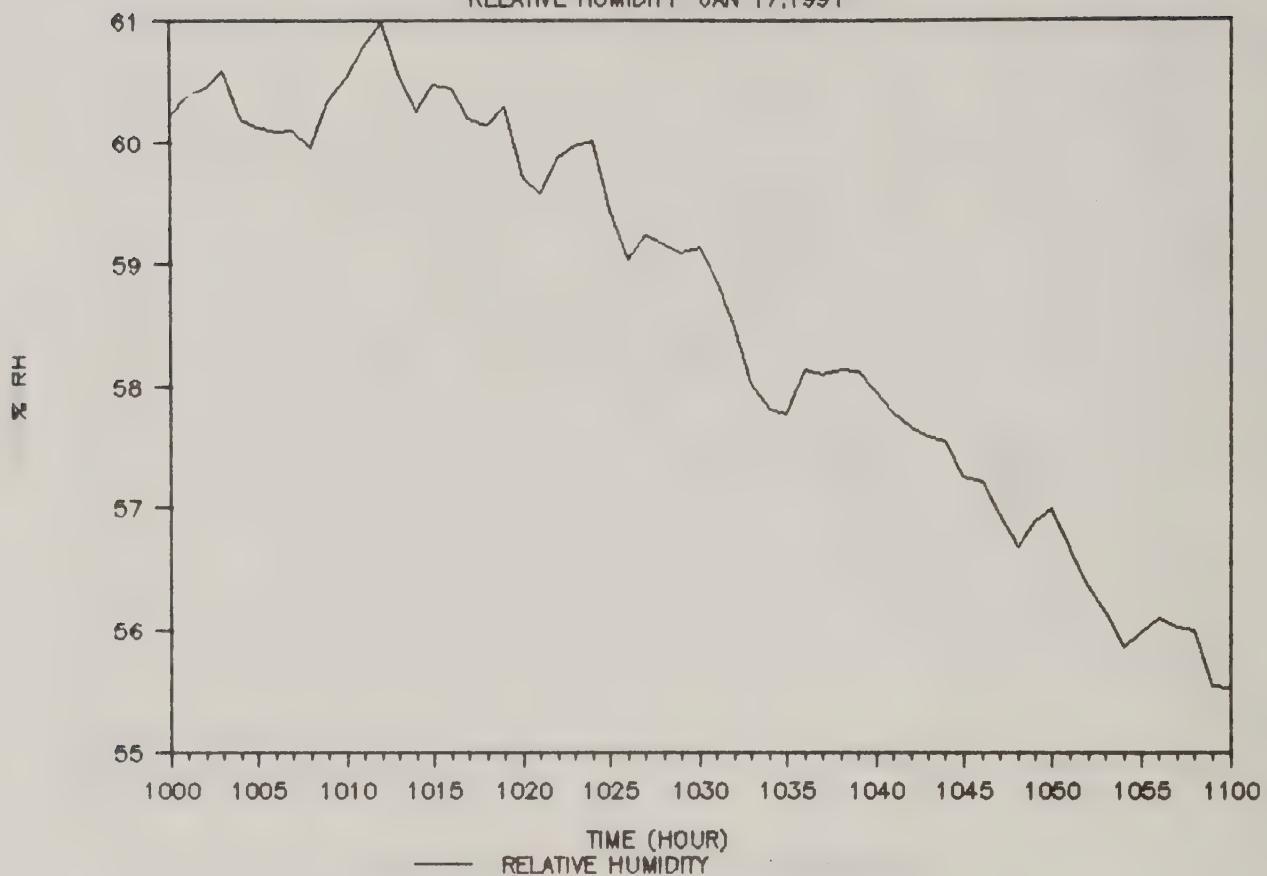
TIME (HOUR)

— RELATIVE HUMIDITY

105

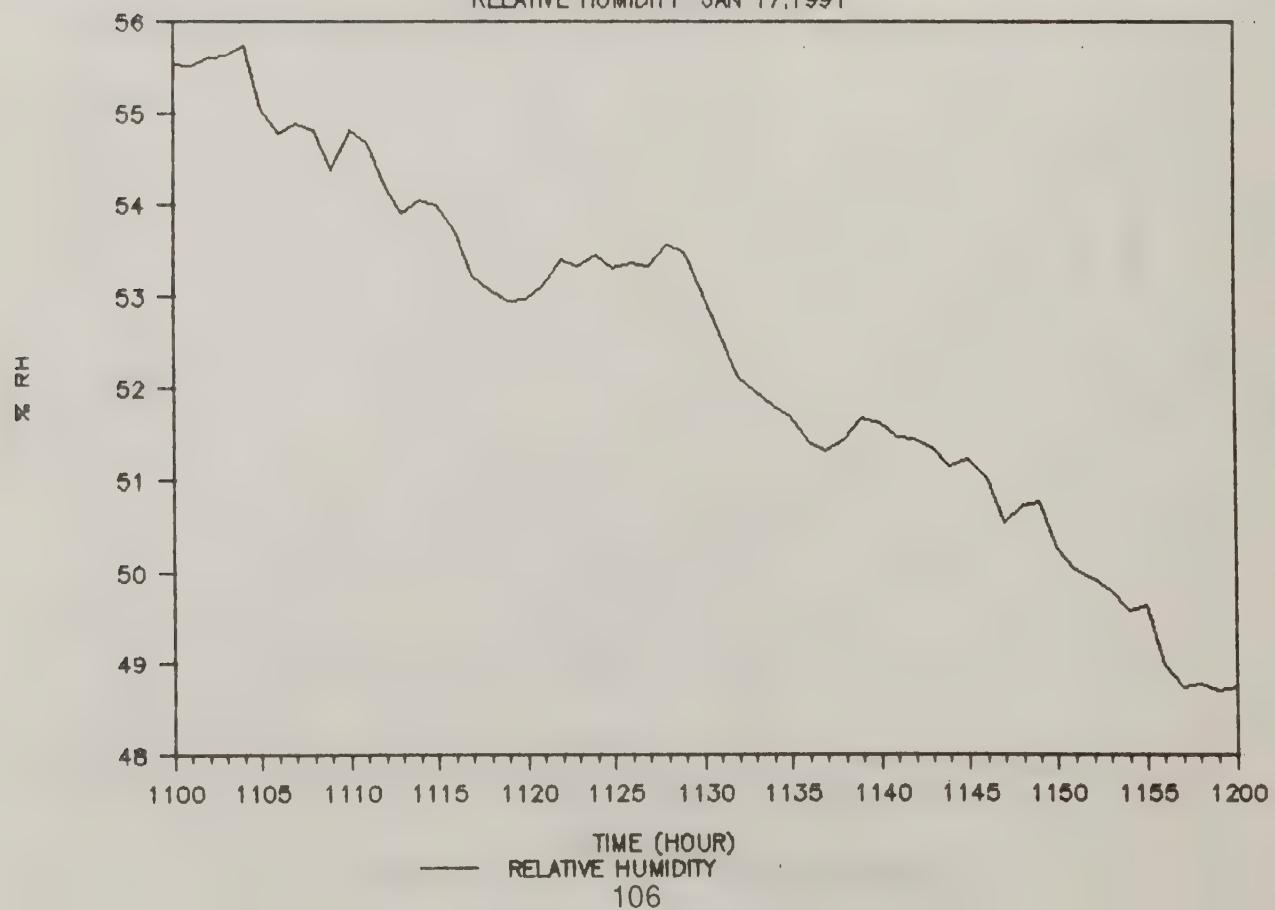
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 17, 1991



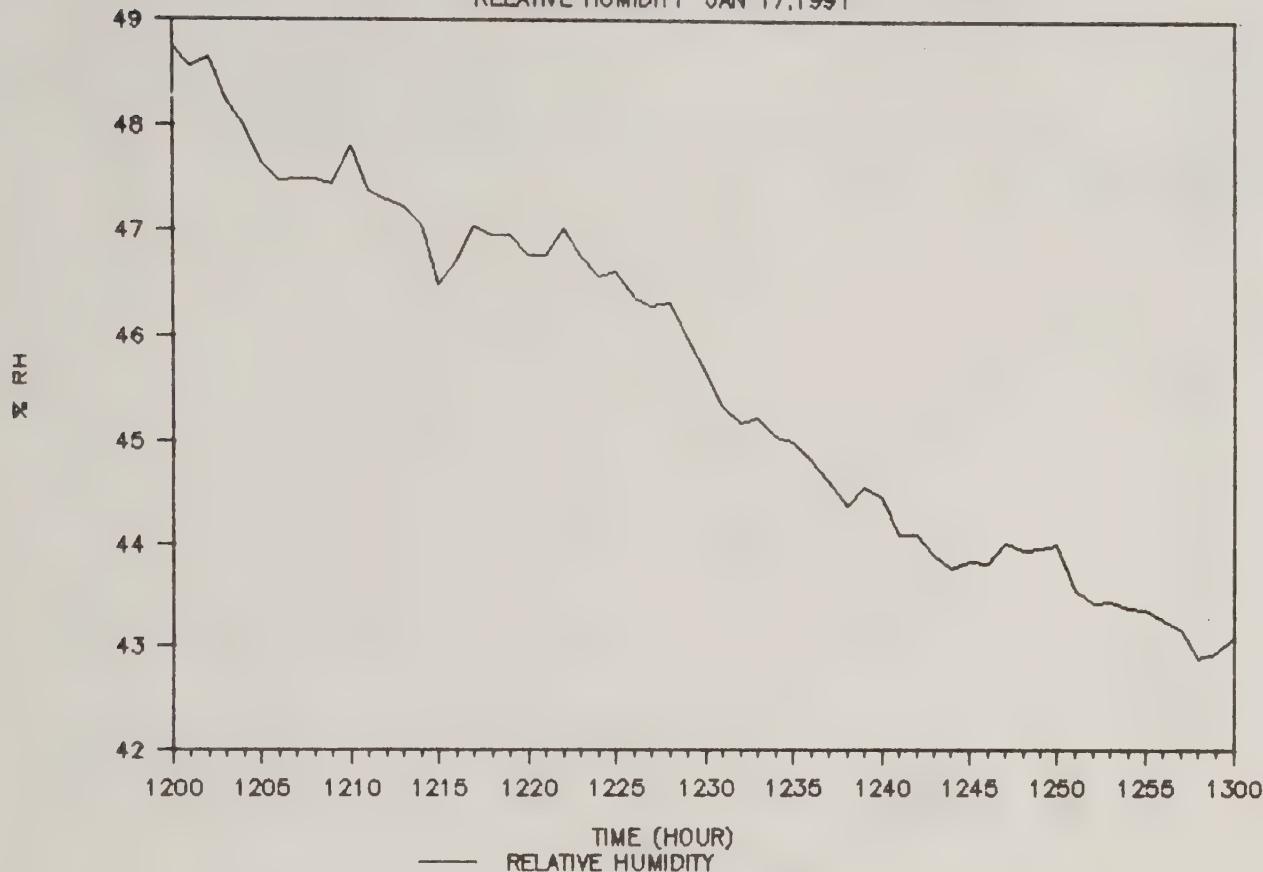
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 17, 1991



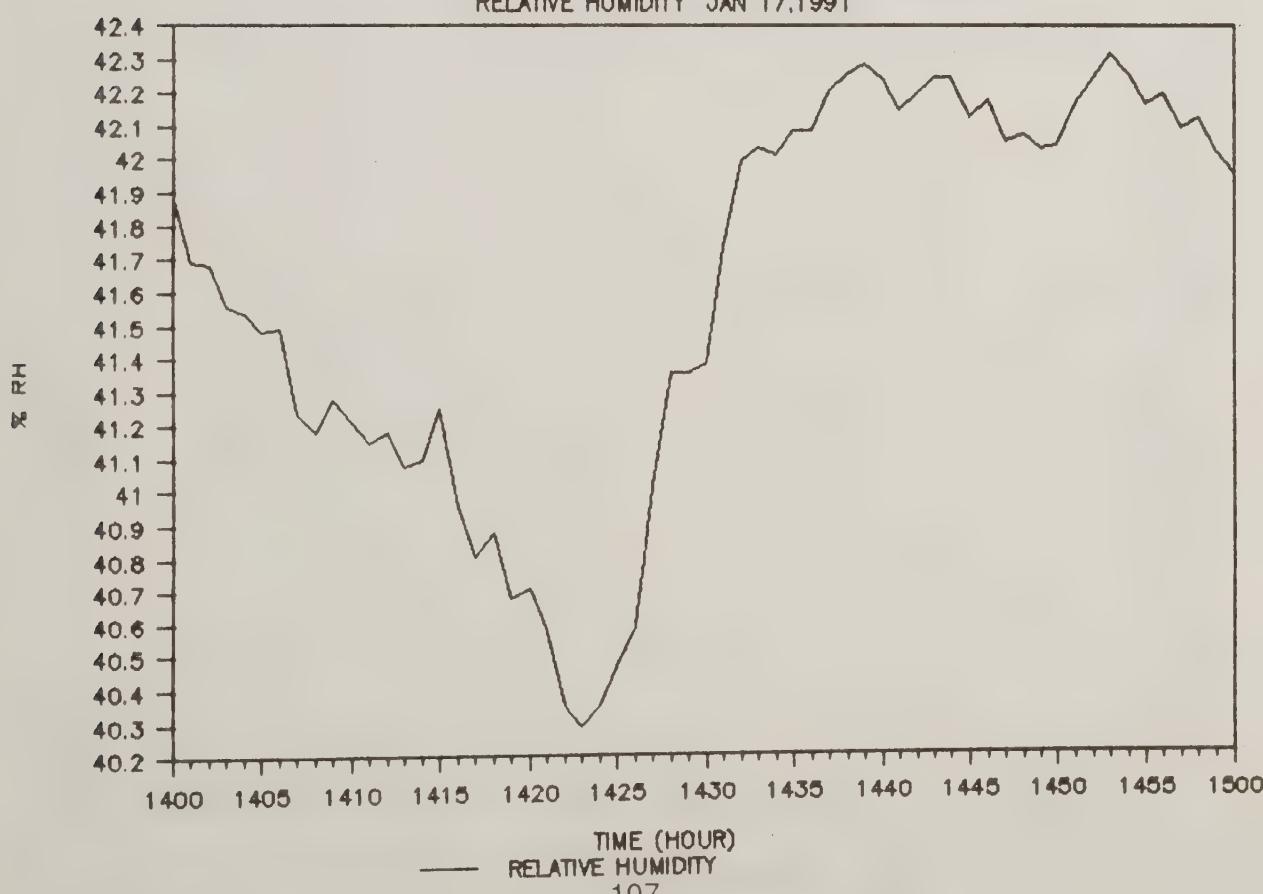
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 17,1991



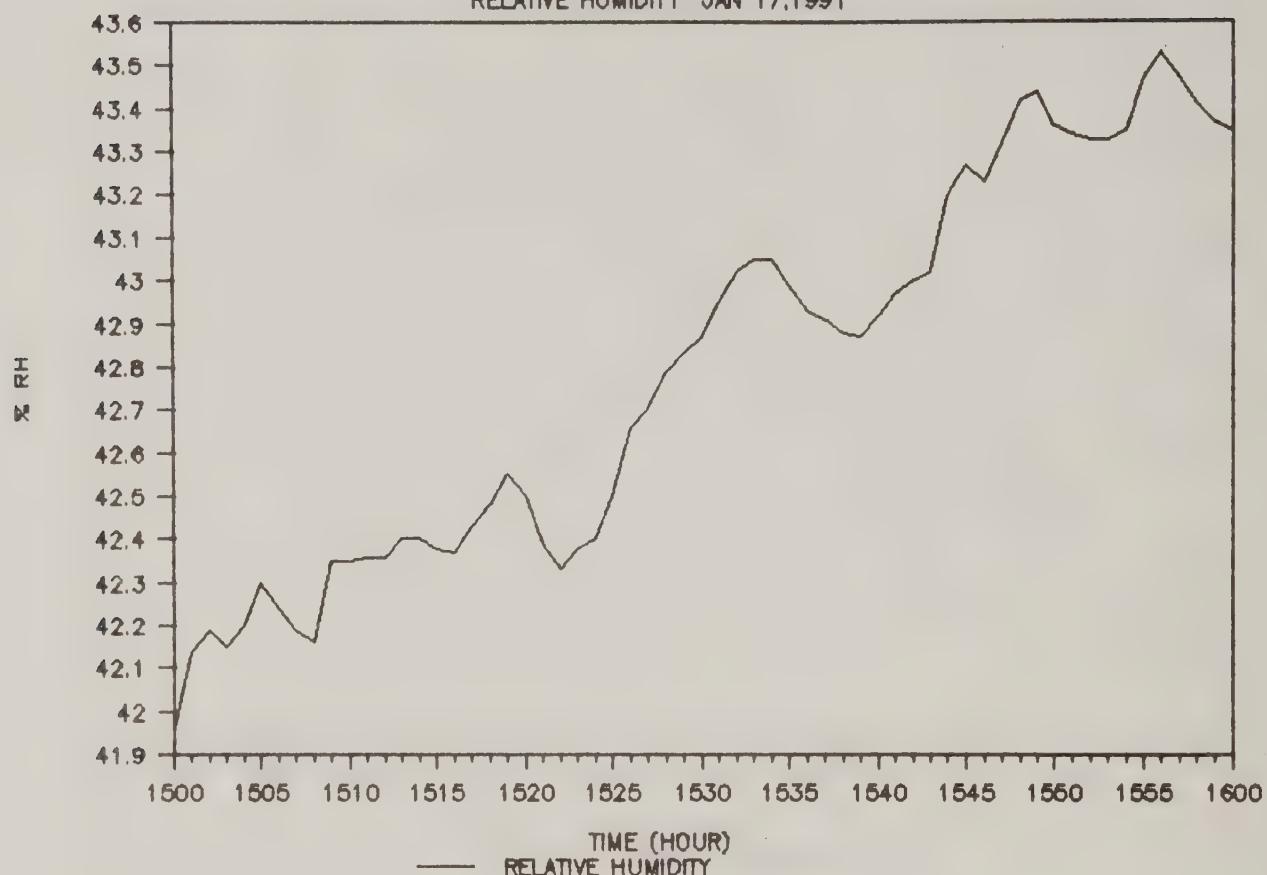
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 17,1991



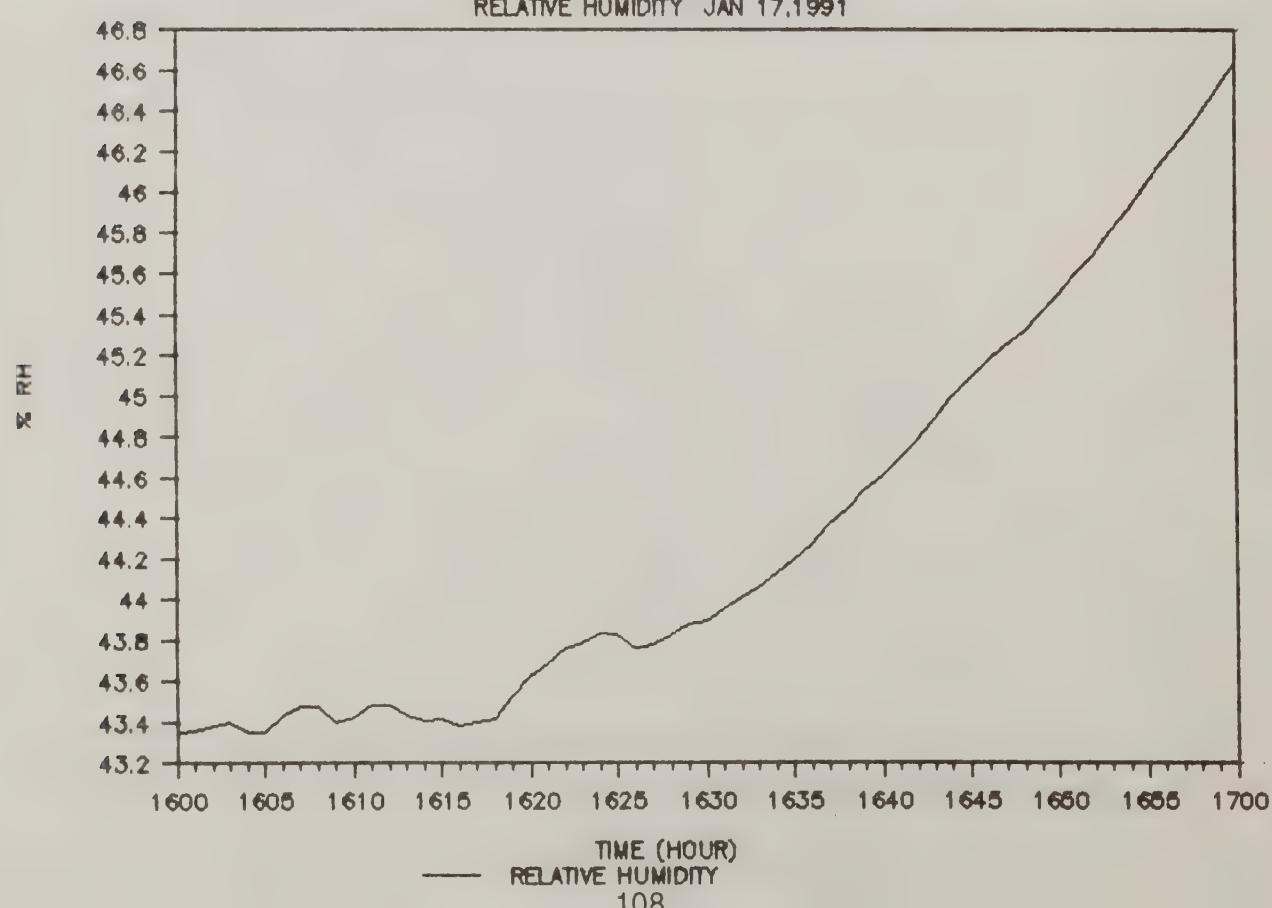
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 17,1991



DAVIS WEATHER DATA STN #2

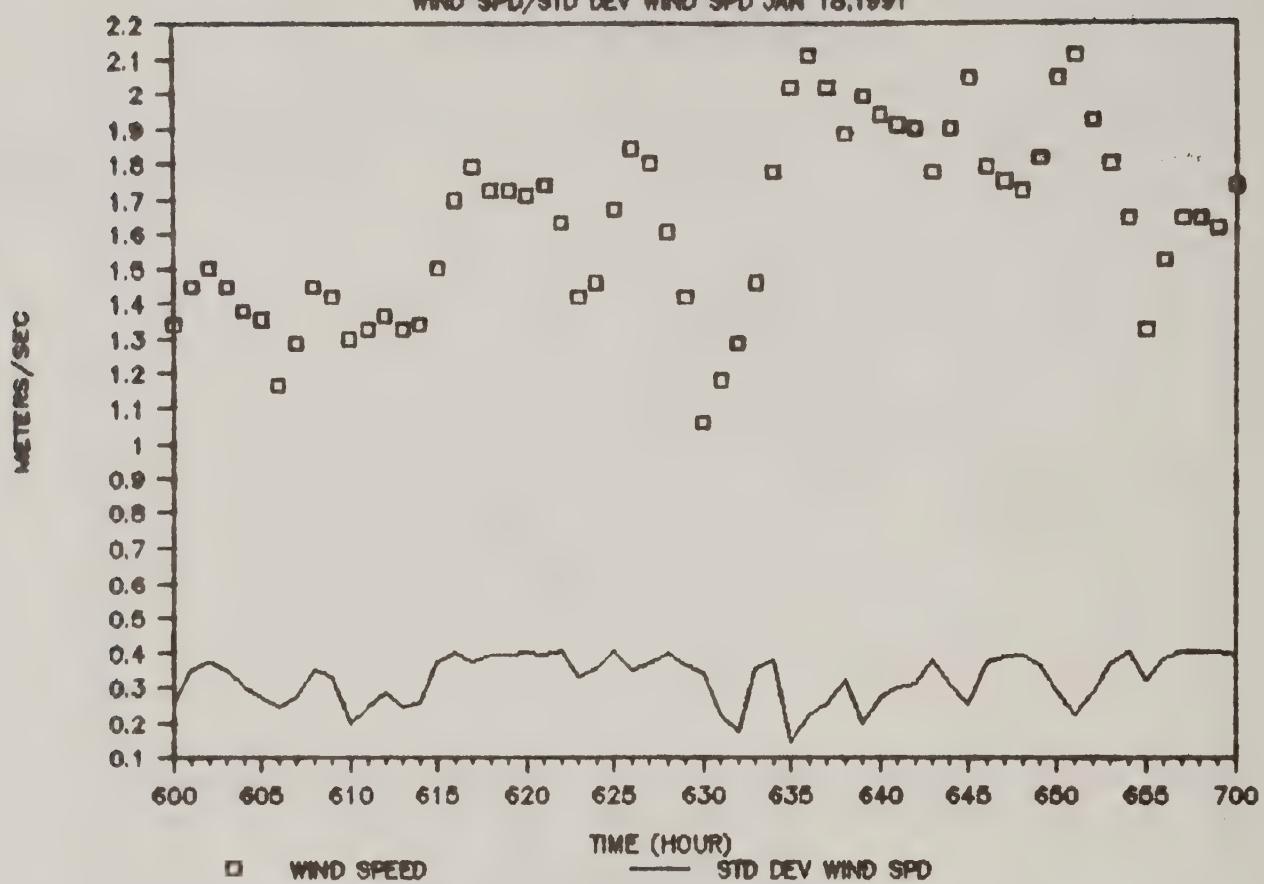
RELATIVE HUMIDITY JAN 17,1991



Davis Weather Data Station No. 1
January 18, 1991

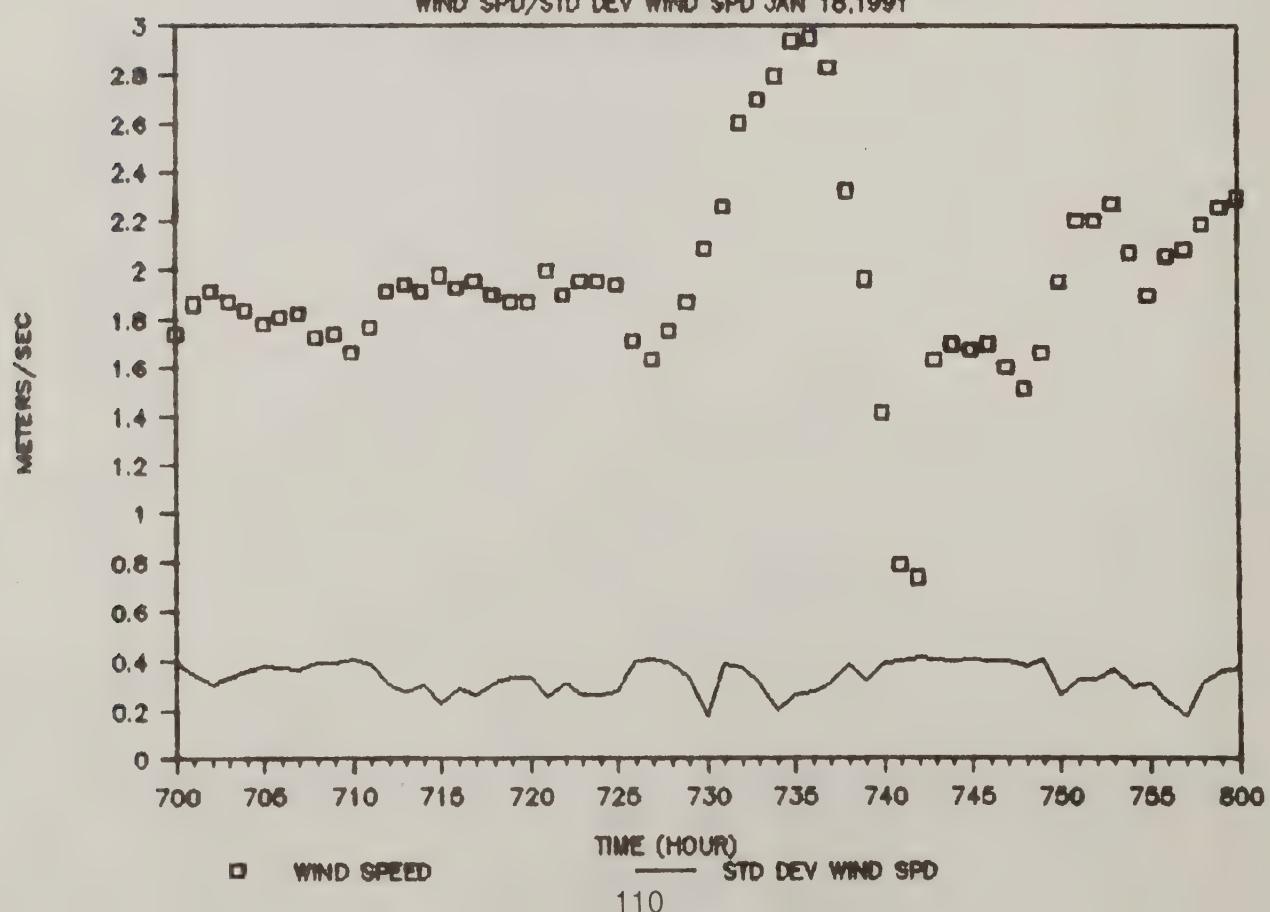
DAVIS WEATHER DAT STN #1

WIND SPD/STD DEV WIND SPD JAN 18,1991



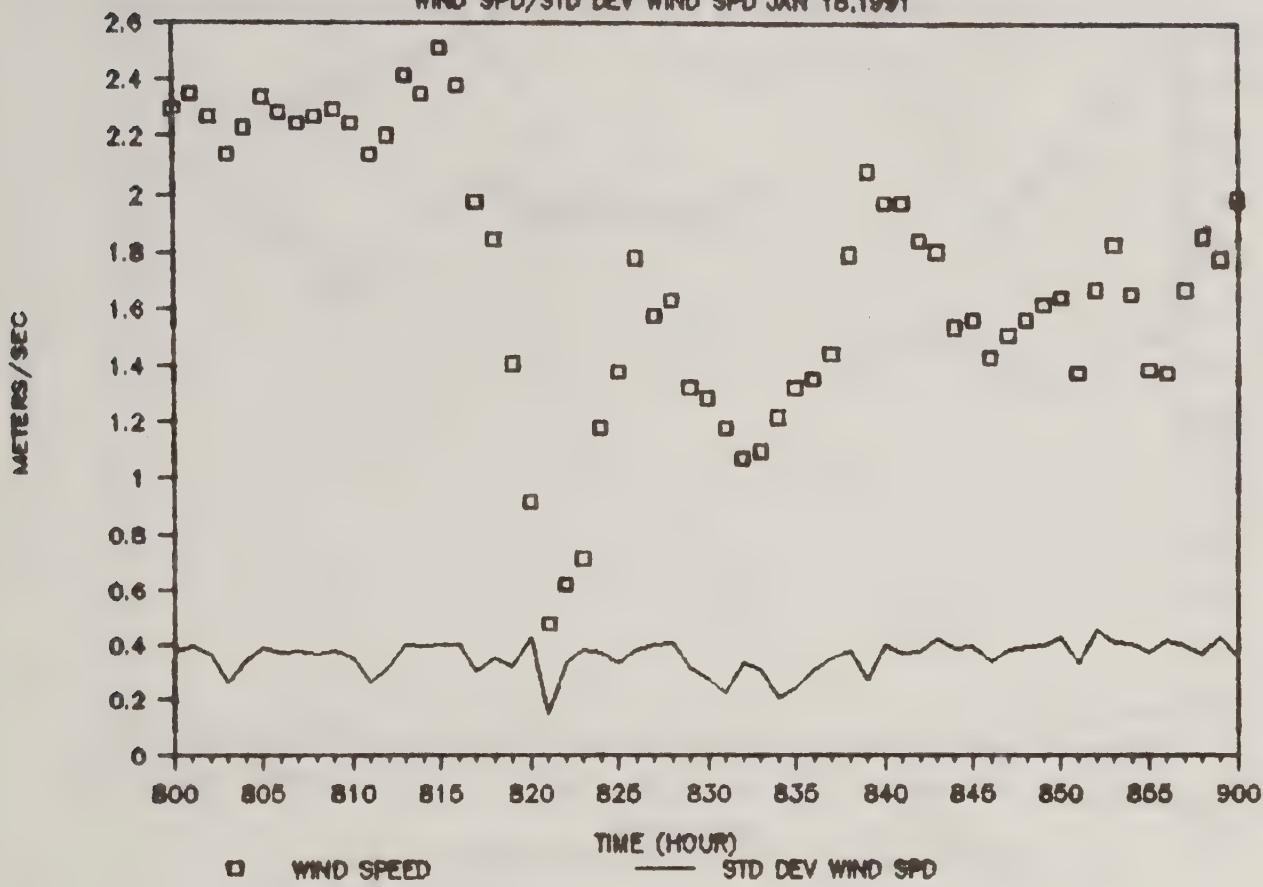
DAVIS WEATHER DAT STN #1

WIND SPD/STD DEV WIND SPD JAN 18,1991



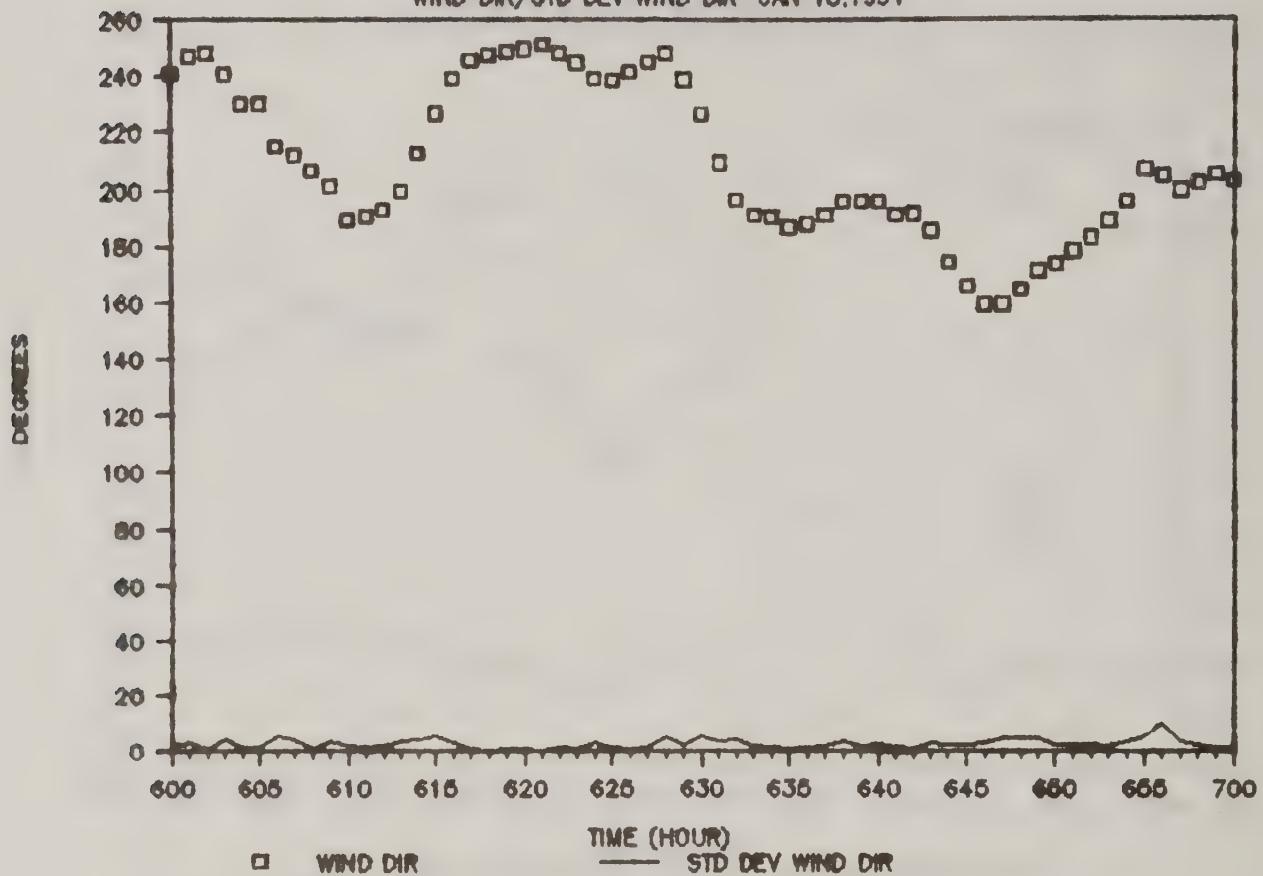
DAVIS WEATHER DAT STN #1

WIND SPD/STD DEV WIND SPD JAN 18, 1991



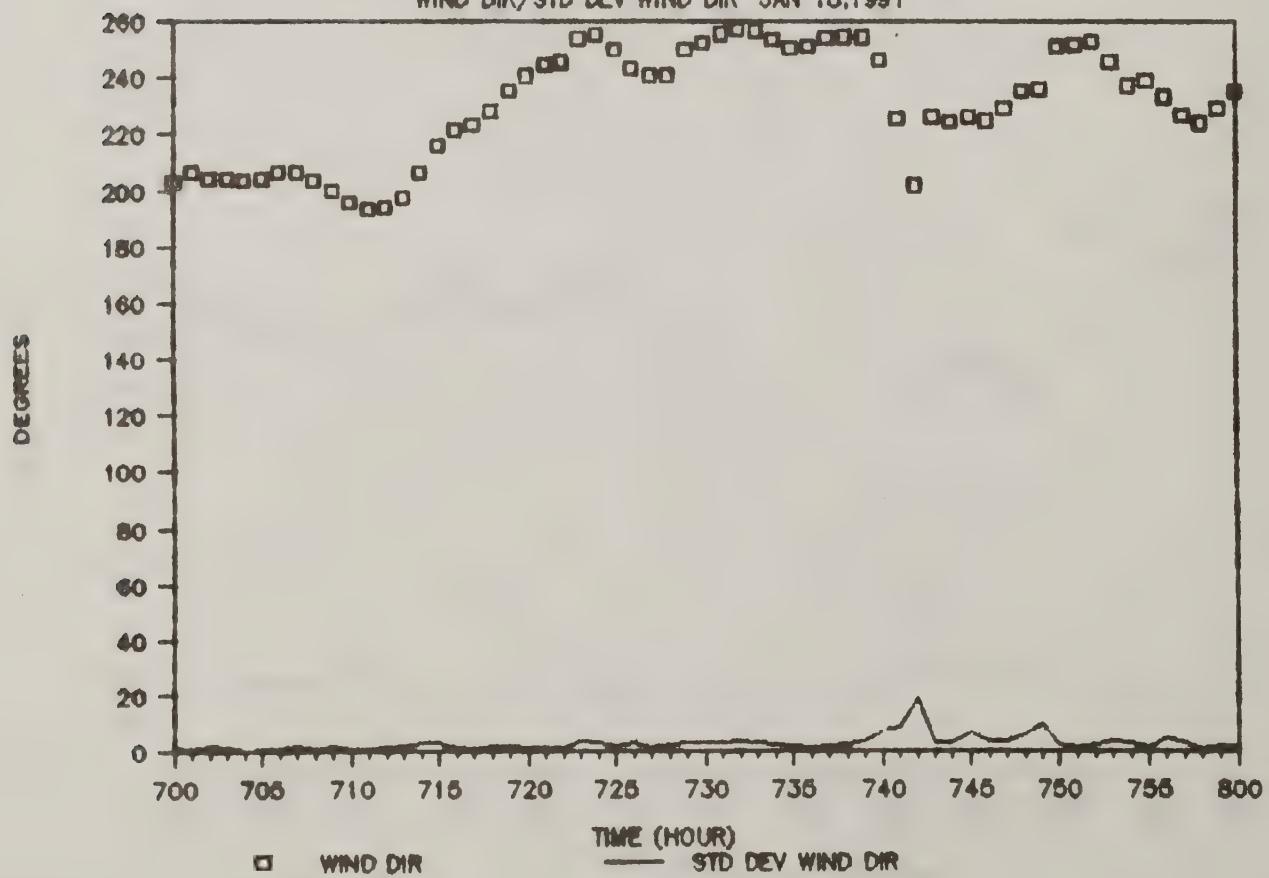
DAVIS WEATHER DAT STN #1

WIND DIR/STD DEV WIND DIR JAN 18, 1991



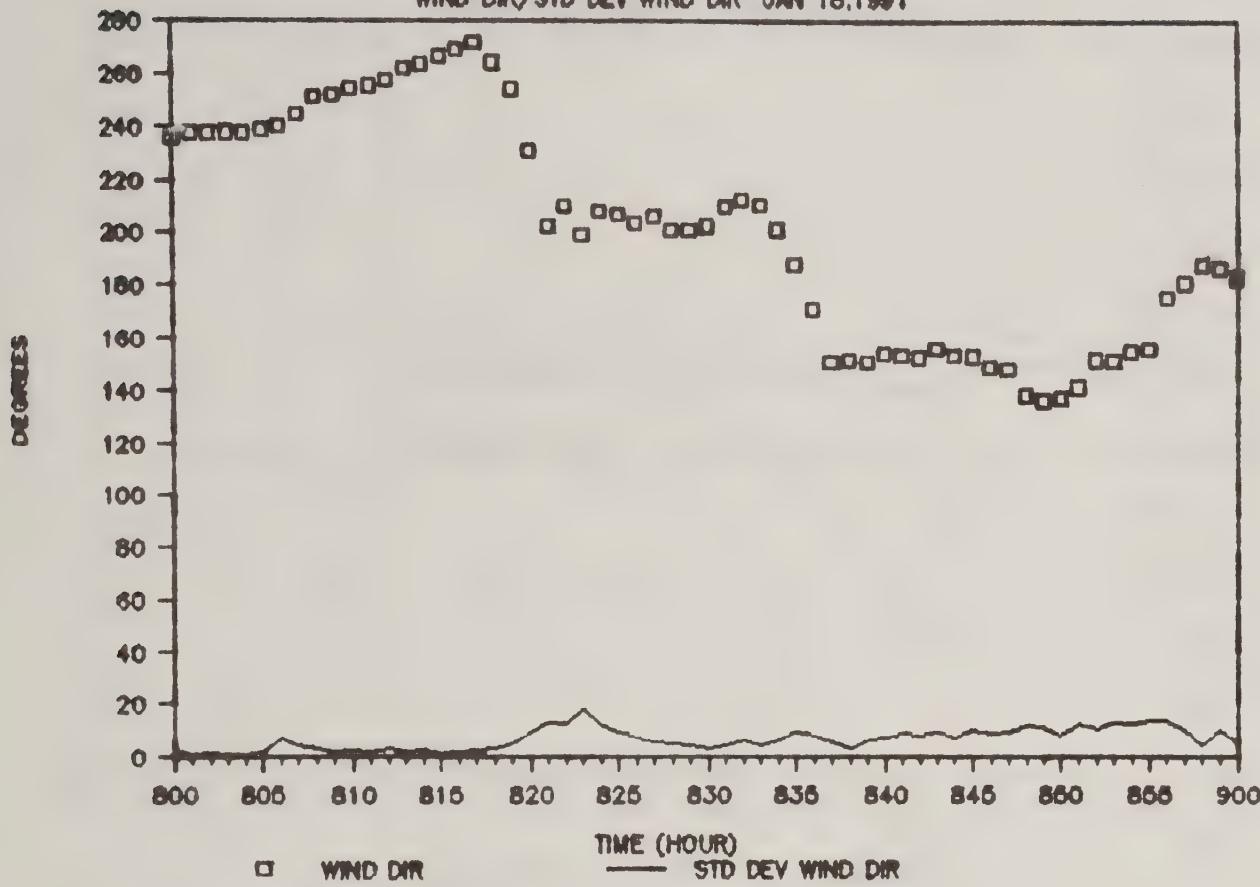
DAVIS WEATHER DAT STN #1

WIND DIR/STD DEV WIND DIR JAN 18, 1991



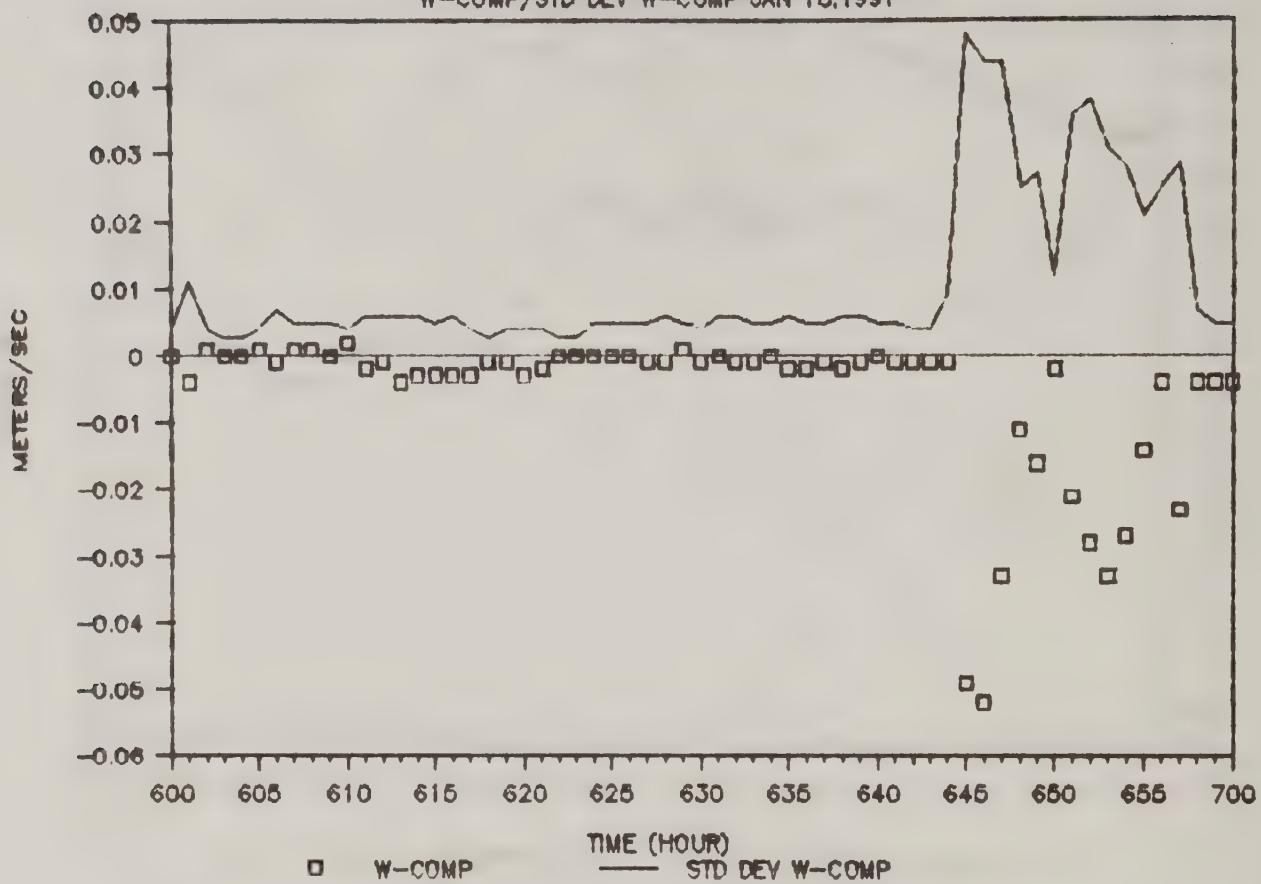
DAVIS WEATHER DAT STN #1

WIND DIR/STD DEV WIND DIR JAN 18, 1991



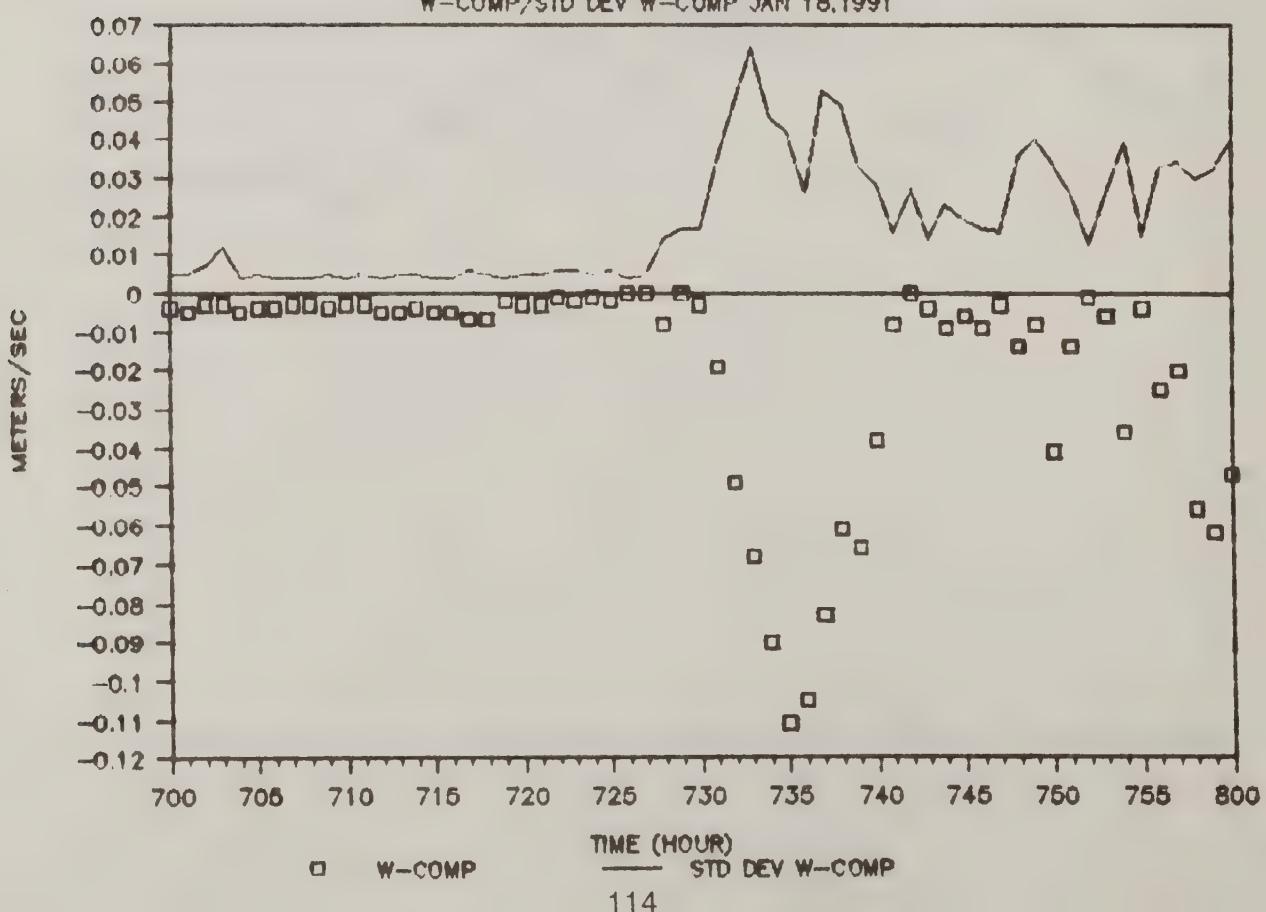
DAVIS WEATHER DAT STN #1

W-COMP/STD DEV W-COMP JAN 18, 1991



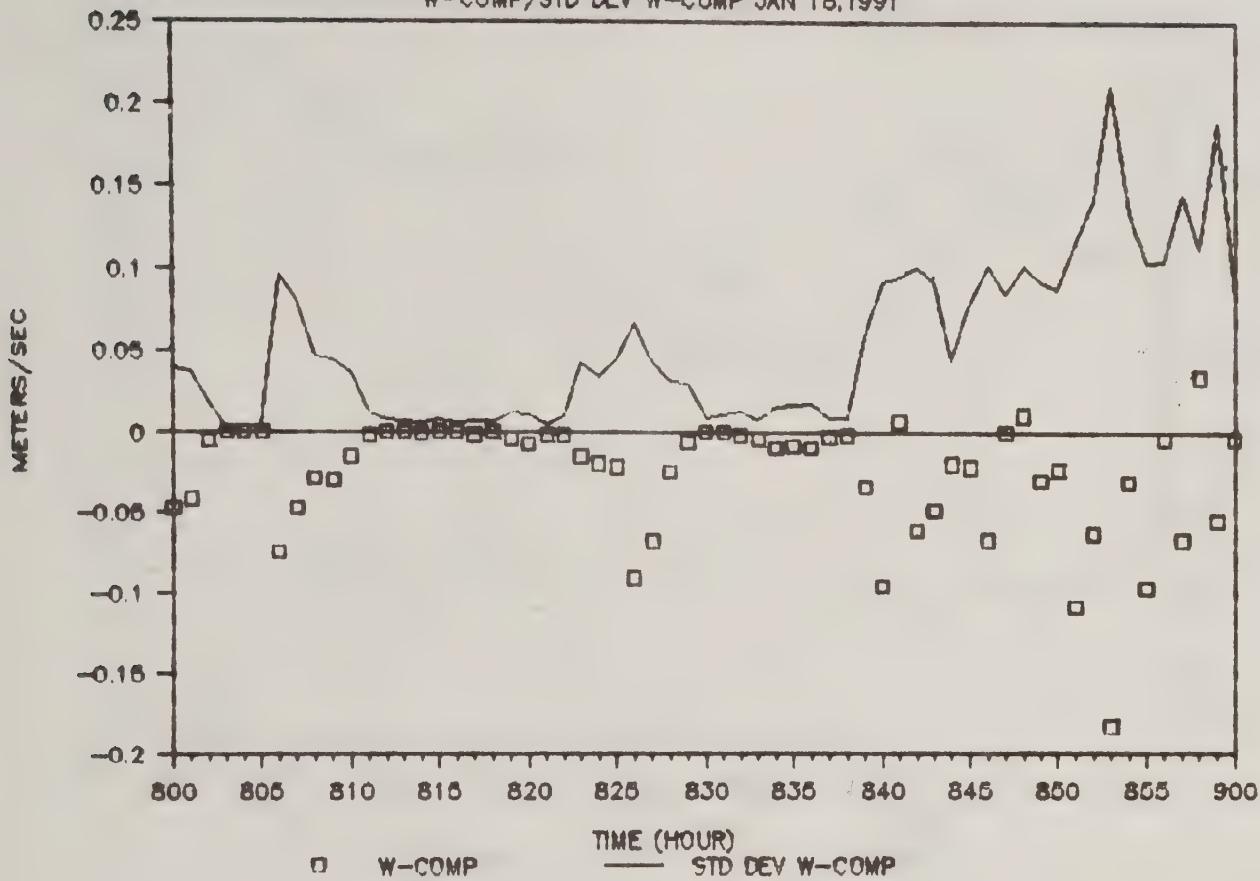
DAVIS WEATHER DAT STN #1

W-COMP/STD DEV W-COMP JAN 18, 1991



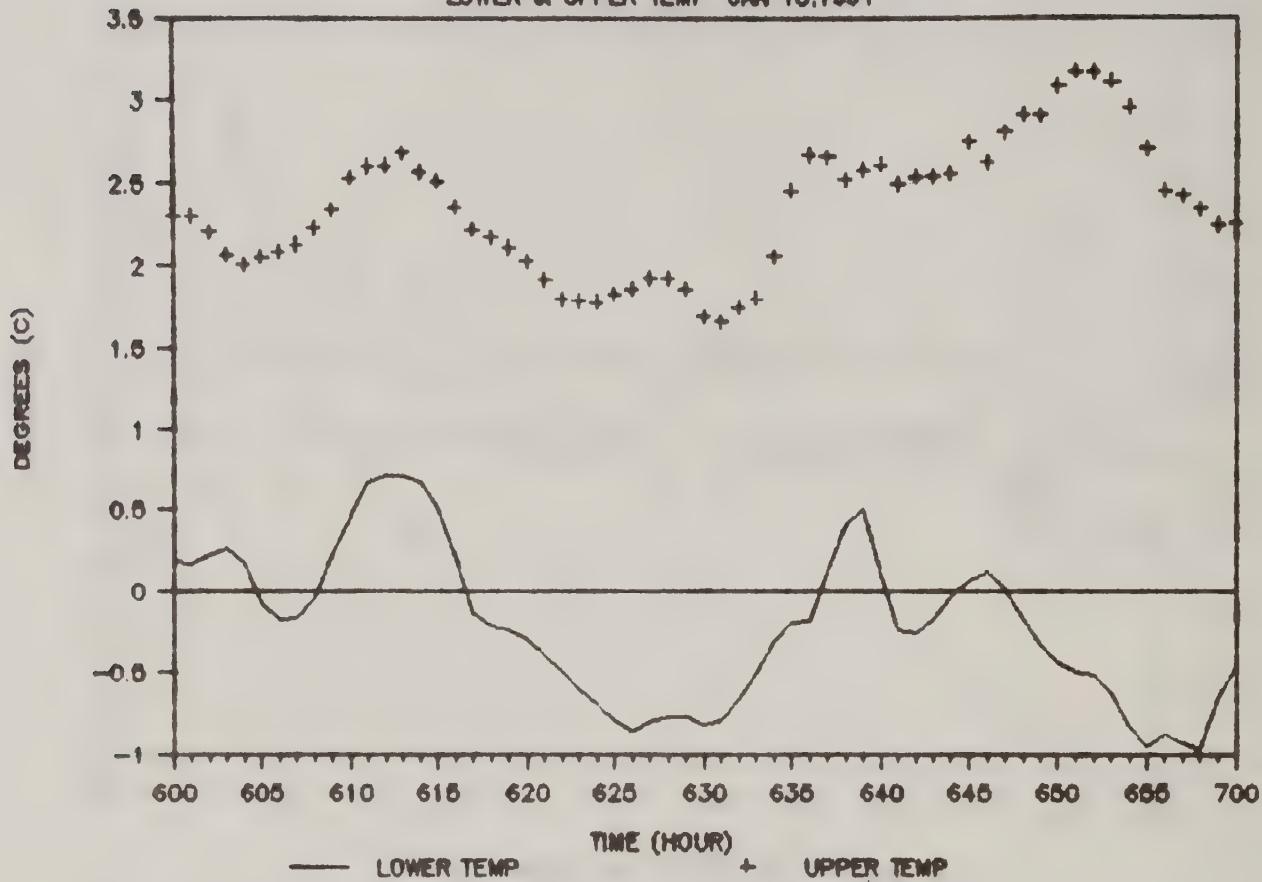
DAVIS WEATHER DAT STN #1

W-COMP/STD DEV W-COMP JAN 18, 1991



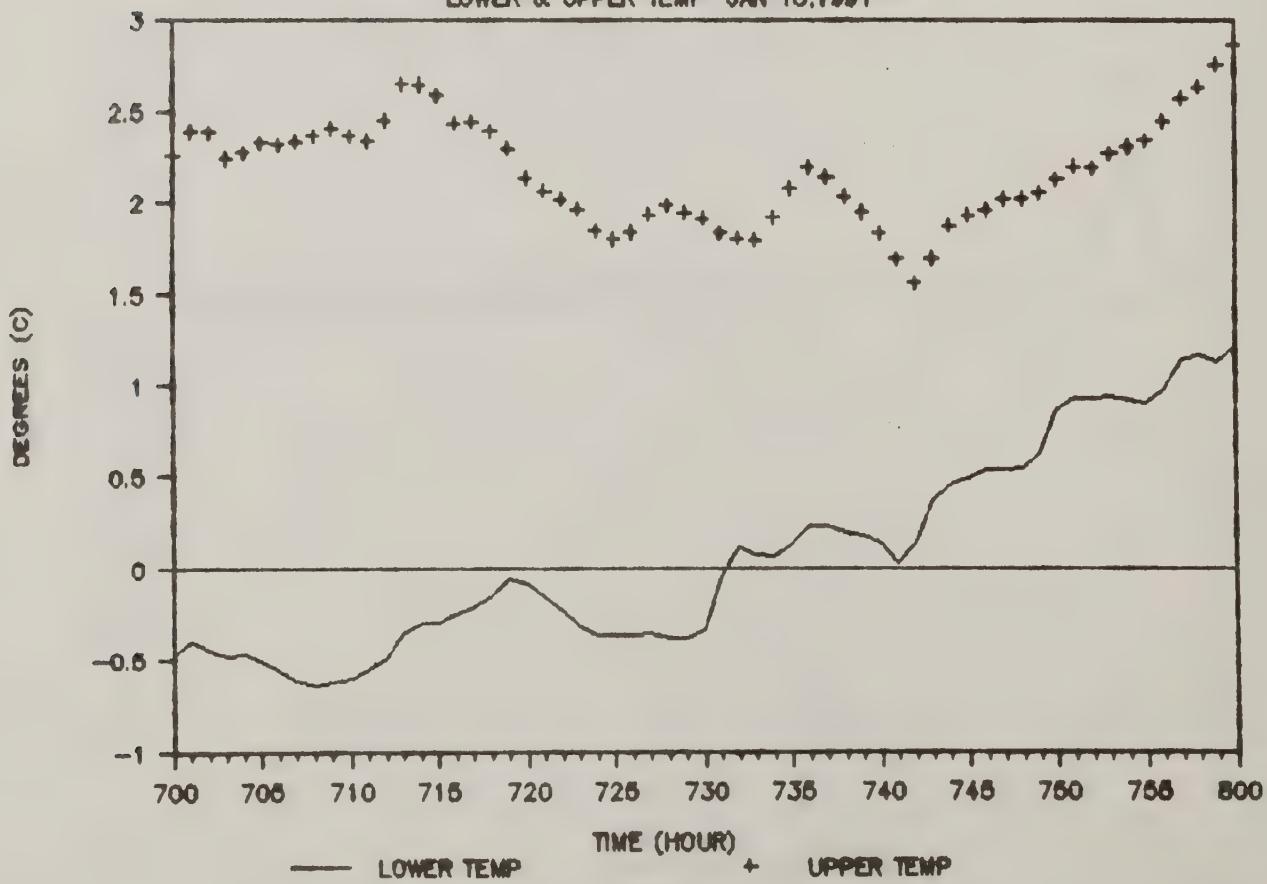
DAVIS WEATHER DAT STN #1

LOWER & UPPER TEMP JAN 18, 1991



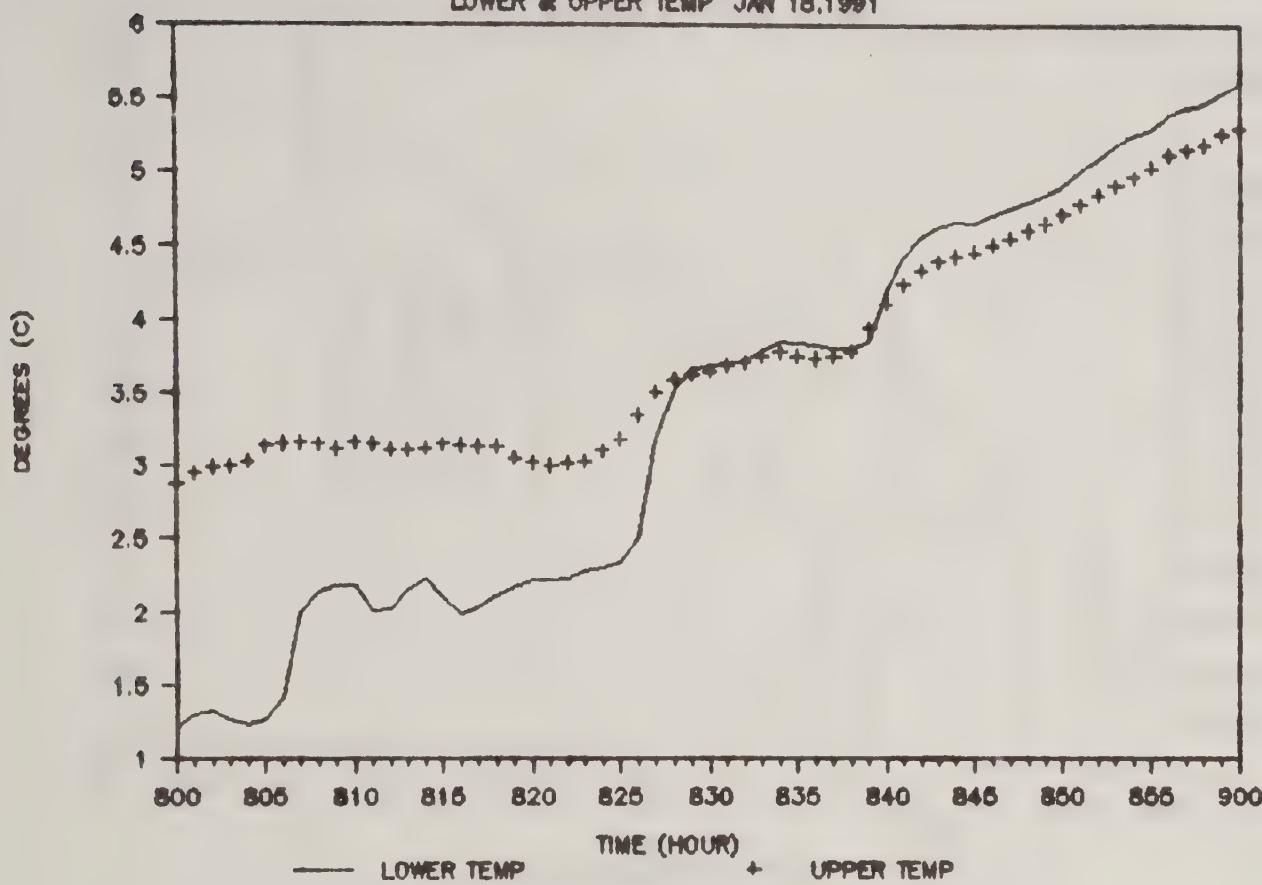
DAVIS WEATHER DAT STN #1

LOWER & UPPER TEMP JAN 18, 1991



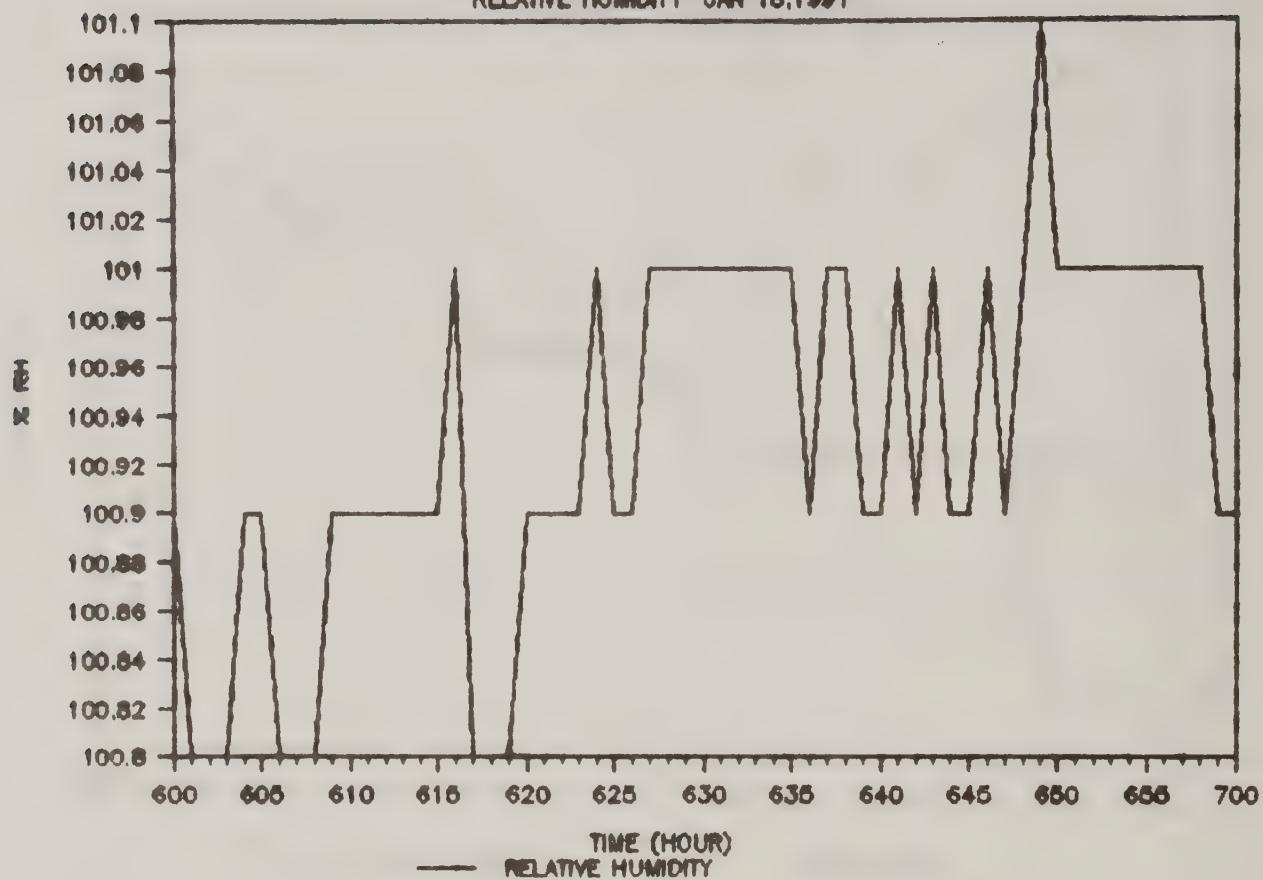
DAVIS WEATHER DAT STN #1

LOWER & UPPER TEMP JAN 18, 1991



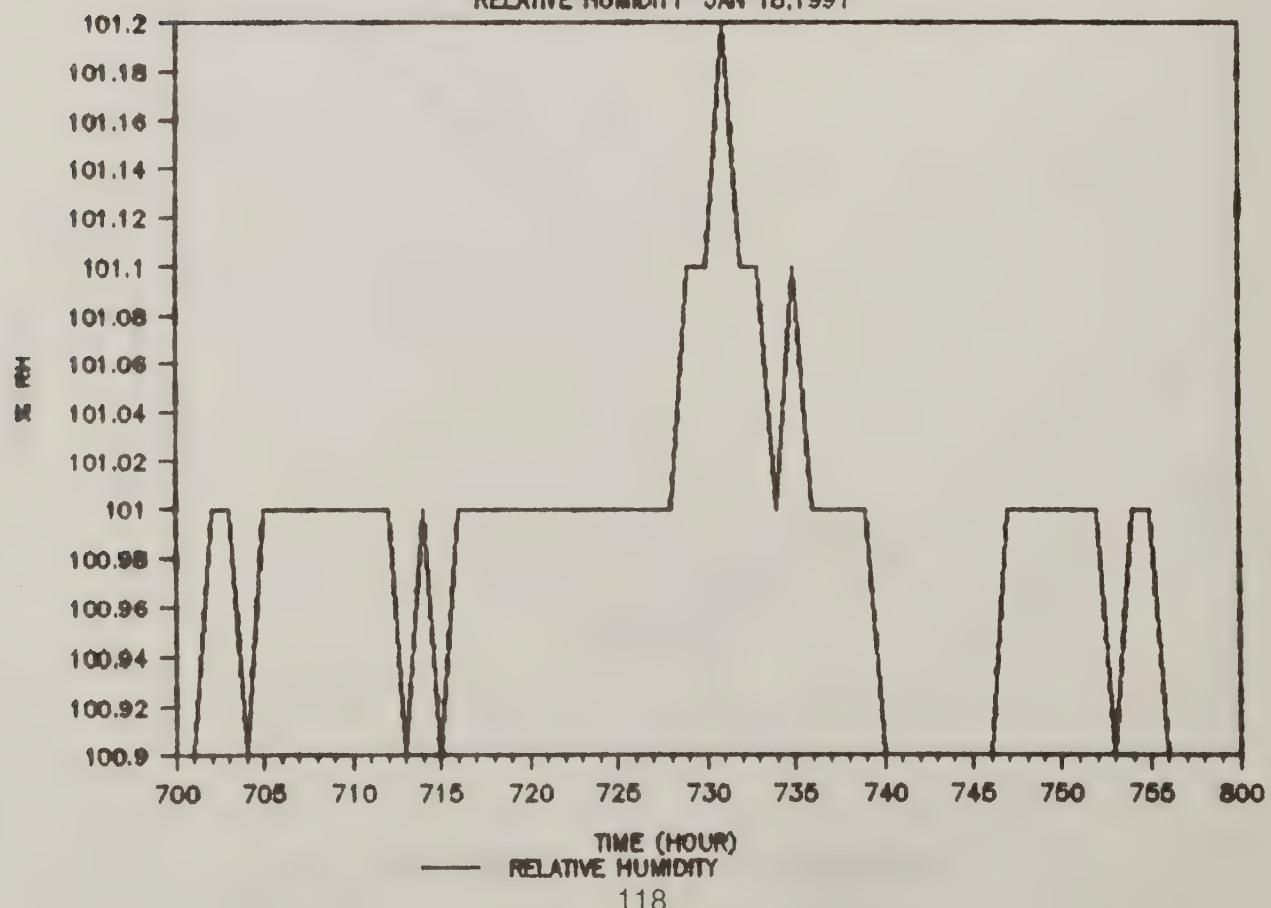
DAVIS WEATHER DAT STN #1

RELATIVE HUMIDITY JAN 18, 1991



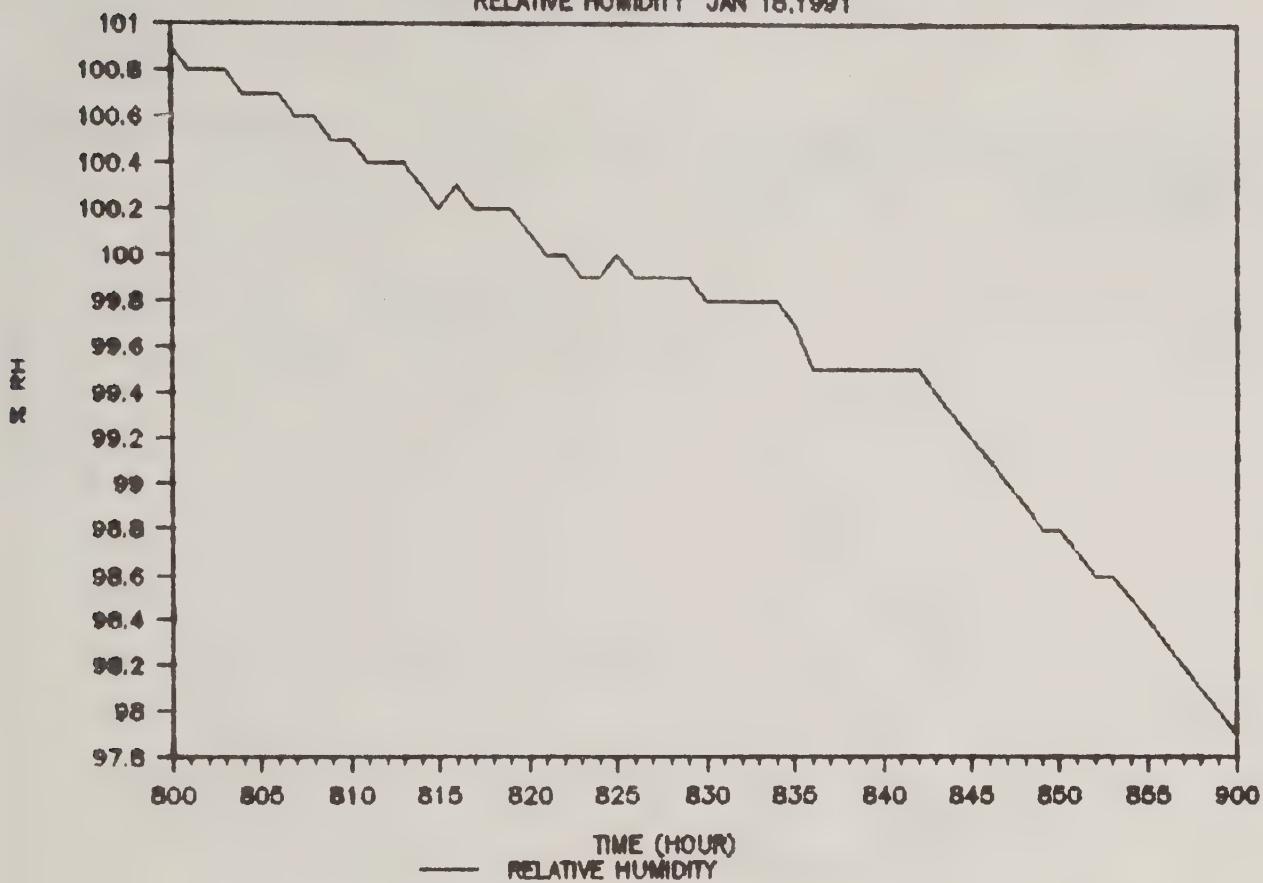
DAVIS WEATHER DAT STN #1

RELATIVE HUMIDITY JAN 18, 1991



DAVIS WEATHER DAT STN #1

RELATIVE HUMIDITY JAN 18, 1991



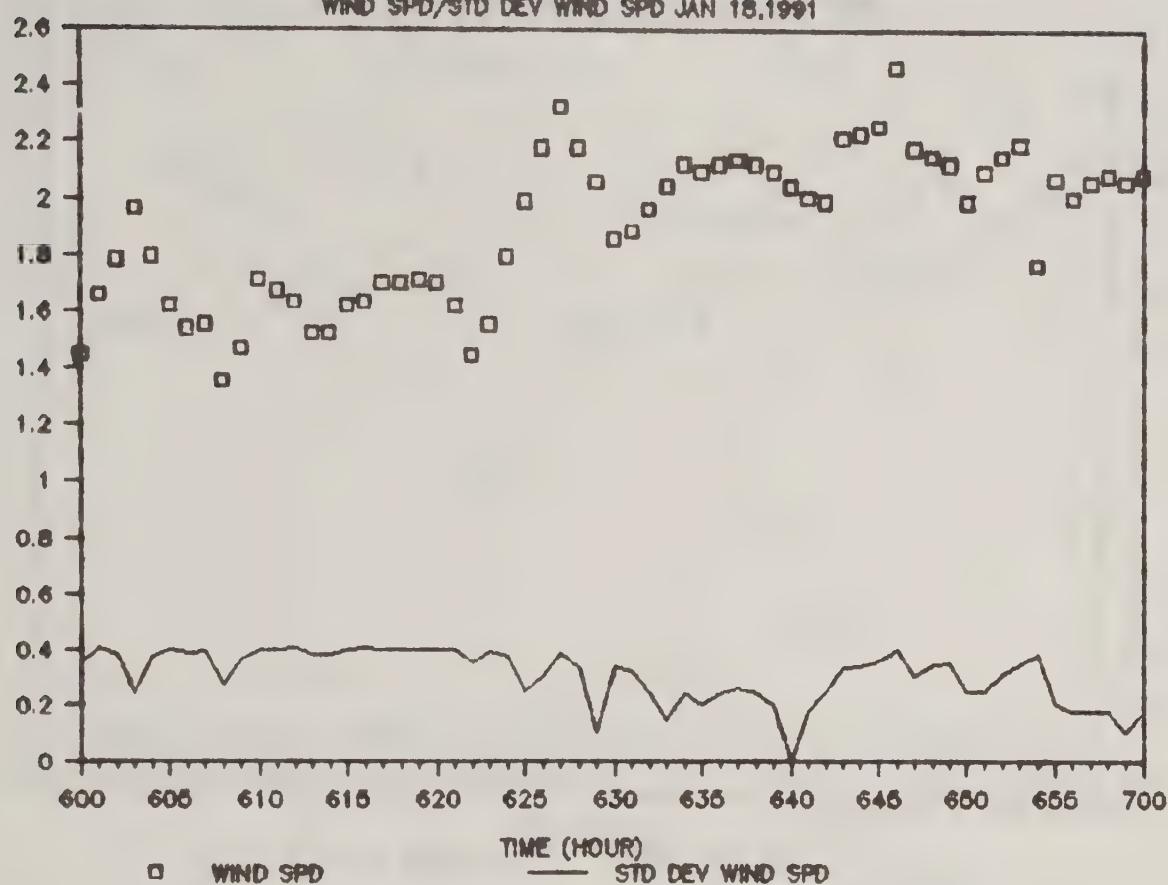
Davis Weather Data Station No. 2

January 18, 1991

DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 18,1991

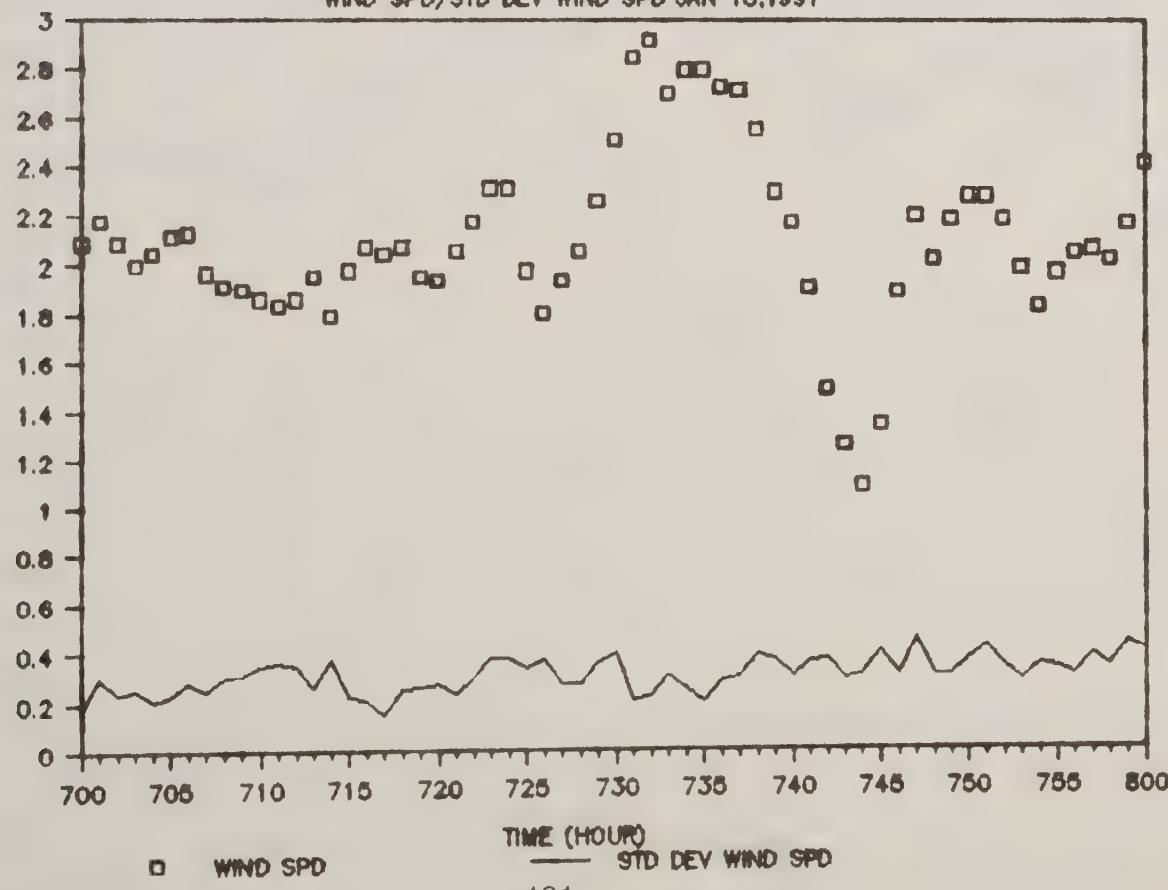
METERS/SEC



DAVIS WEATHER DATA STN #2

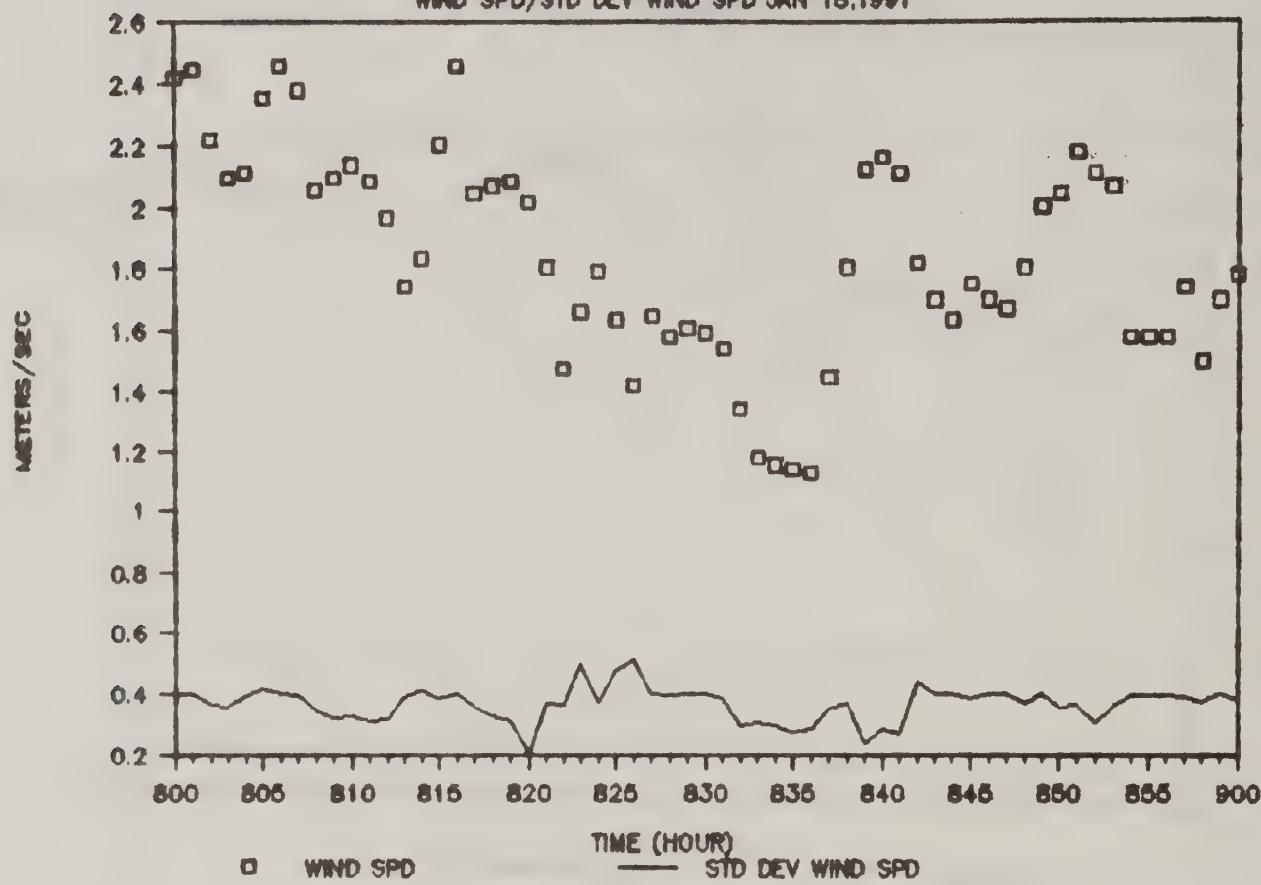
WIND SPD/STD DEV WIND SPD JAN 18,1991

METERS/SEC



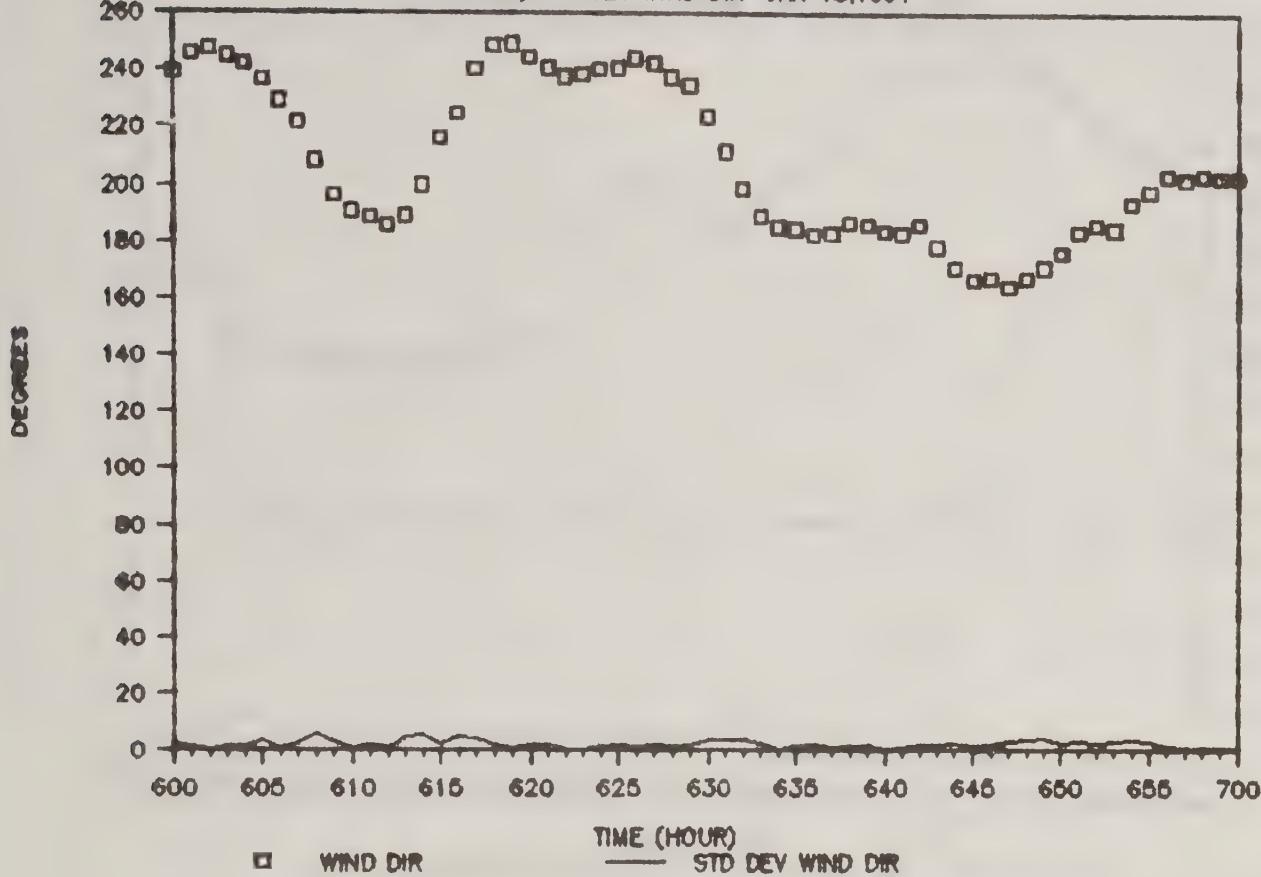
DAVIS WEATHER DATA STN #2

WIND SPD/STD DEV WIND SPD JAN 18, 1991



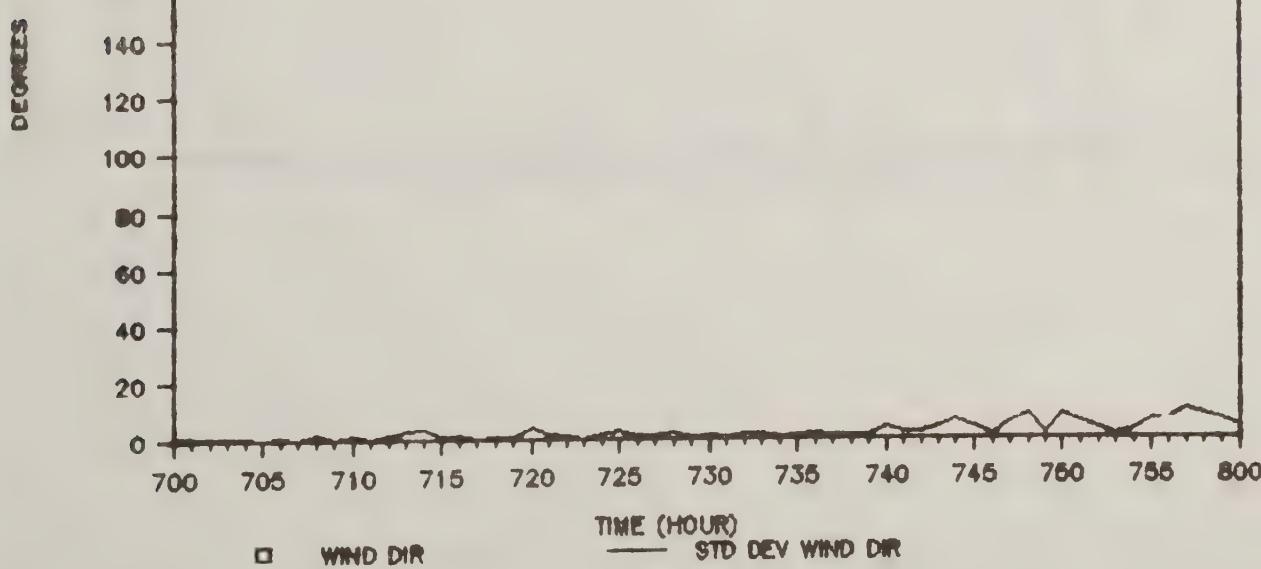
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 18,1991



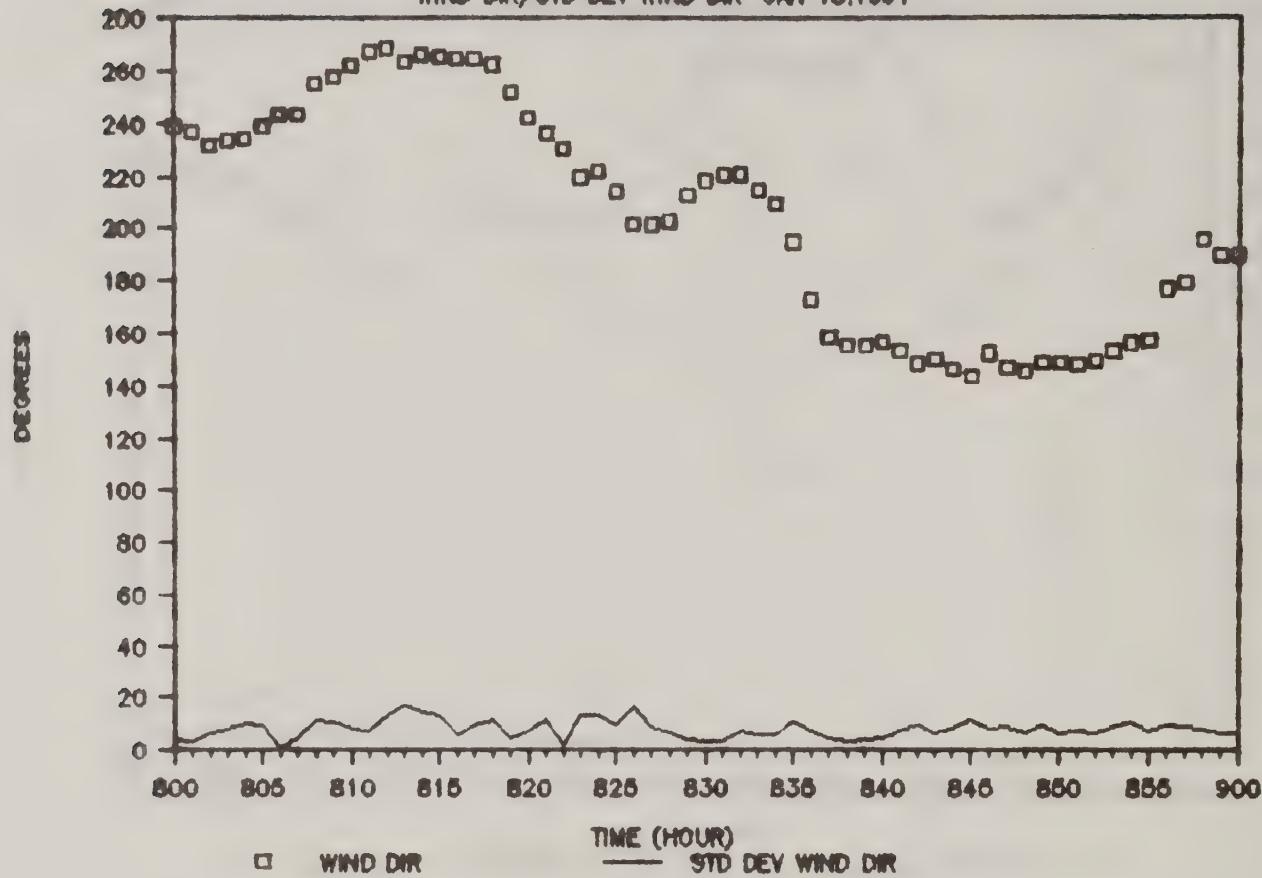
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 18,1991



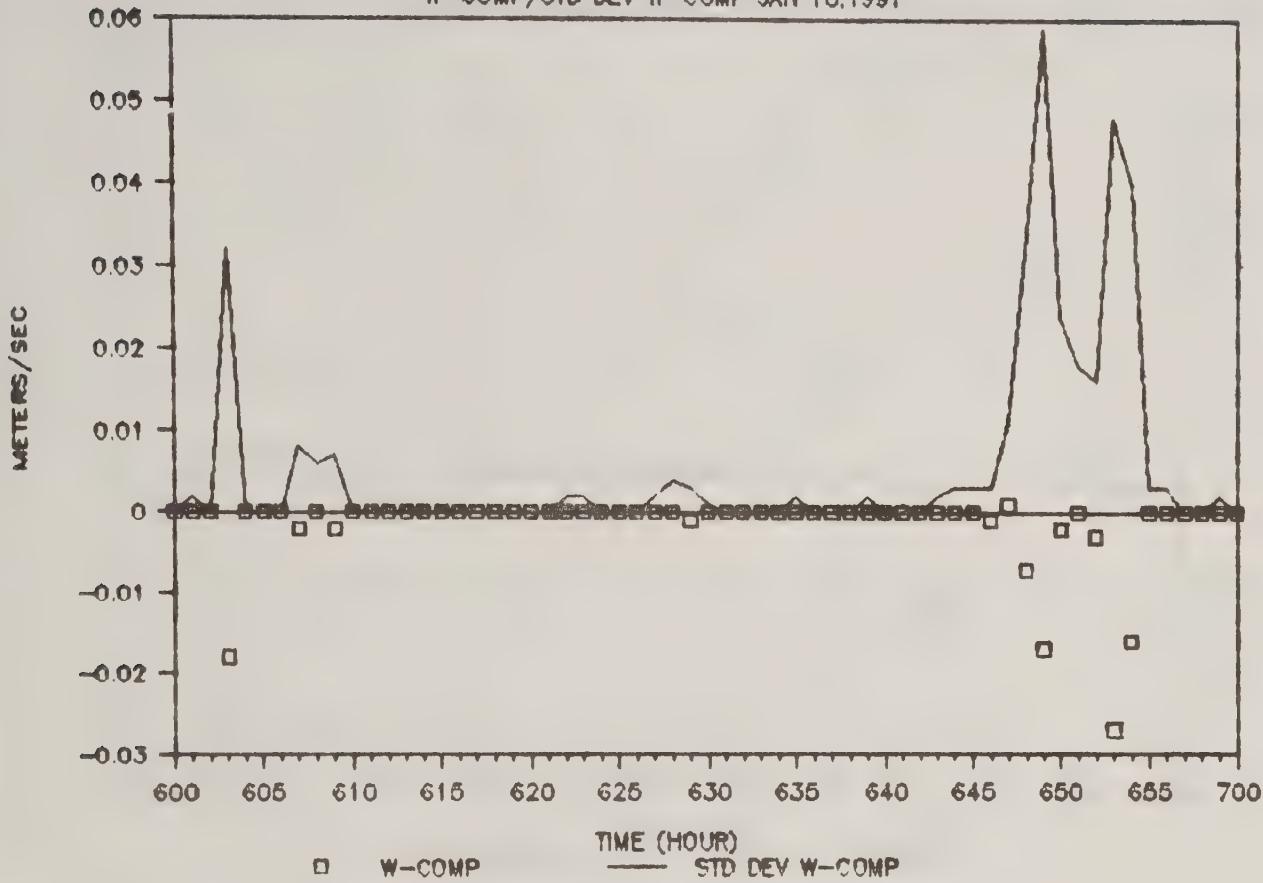
DAVIS WEATHER DATA STN #2

WIND DIR/STD DEV WIND DIR JAN 18, 1991



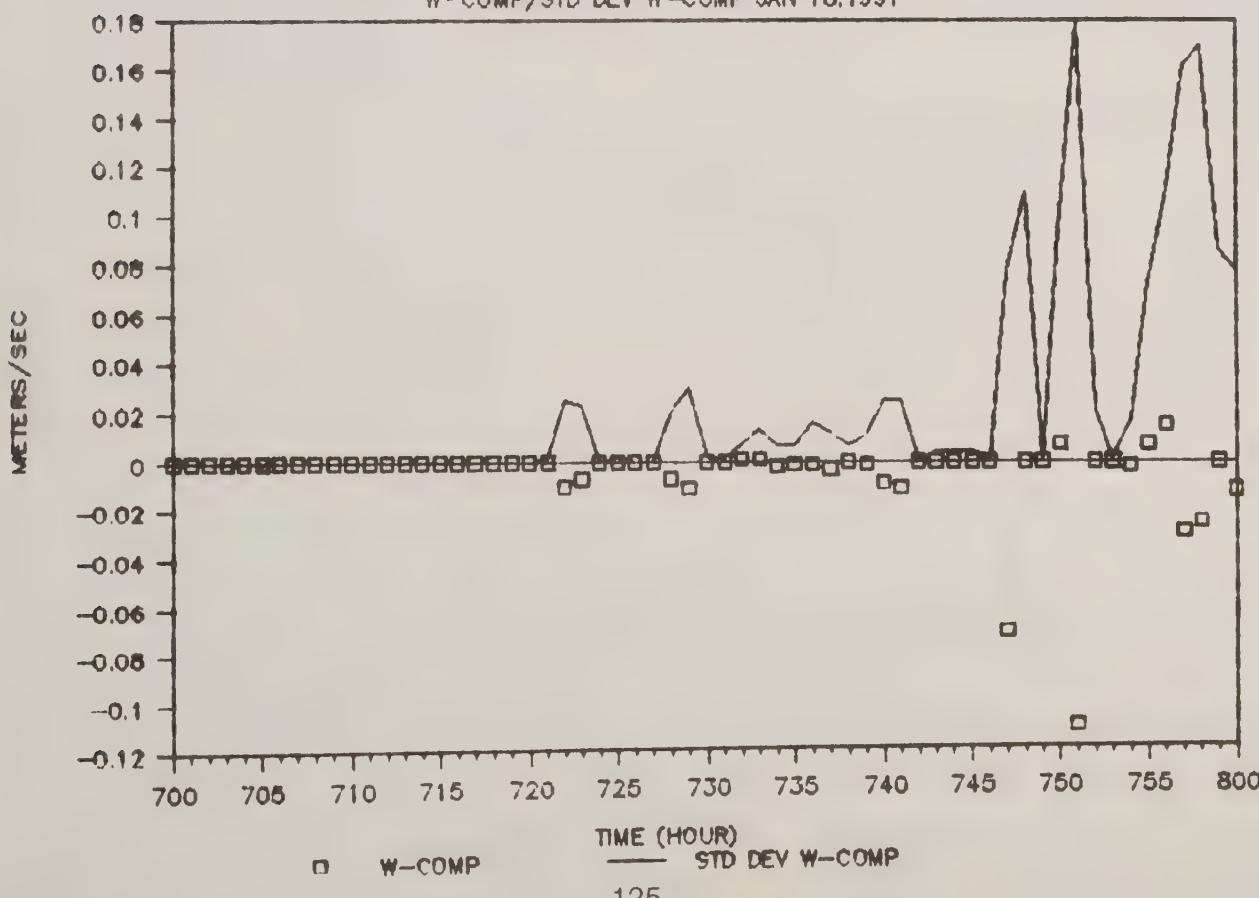
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 18, 1991



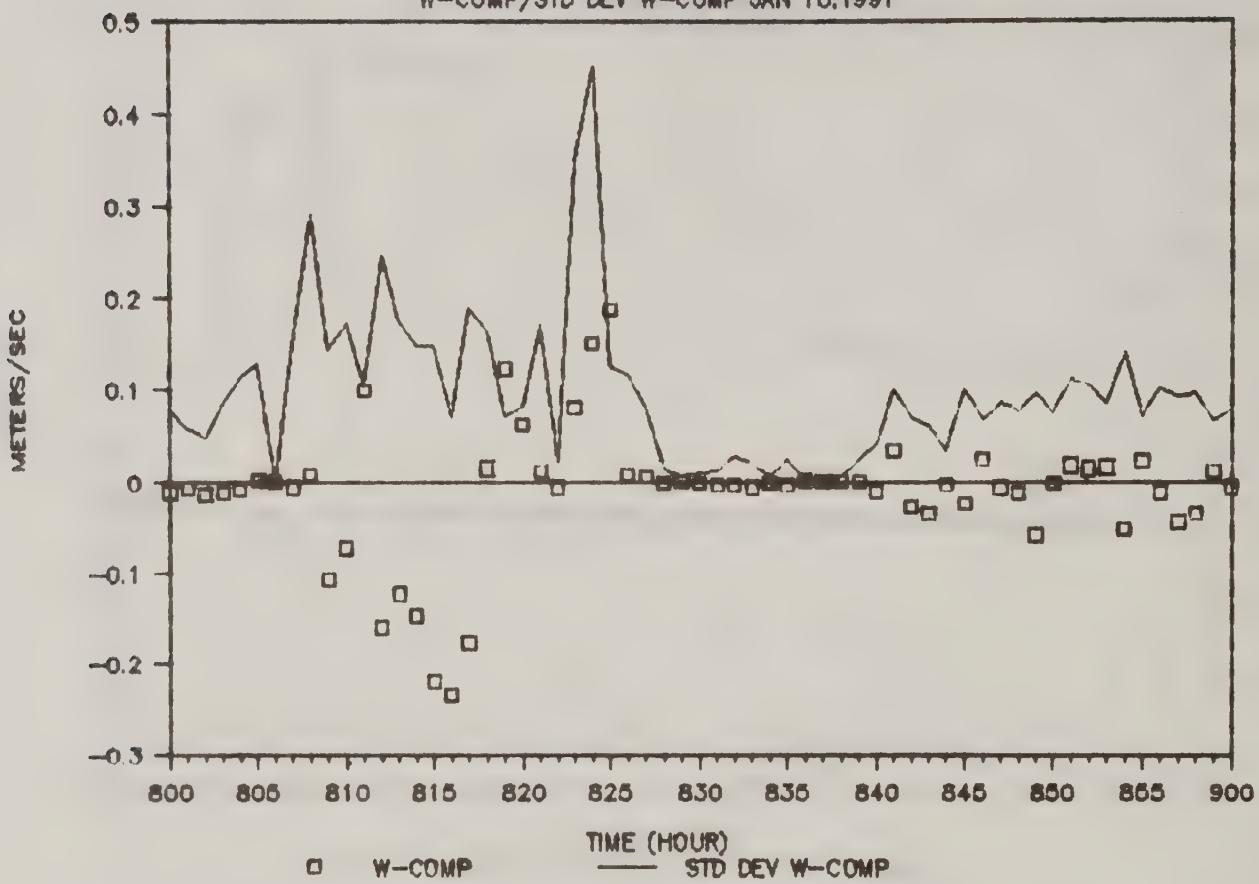
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 18, 1991



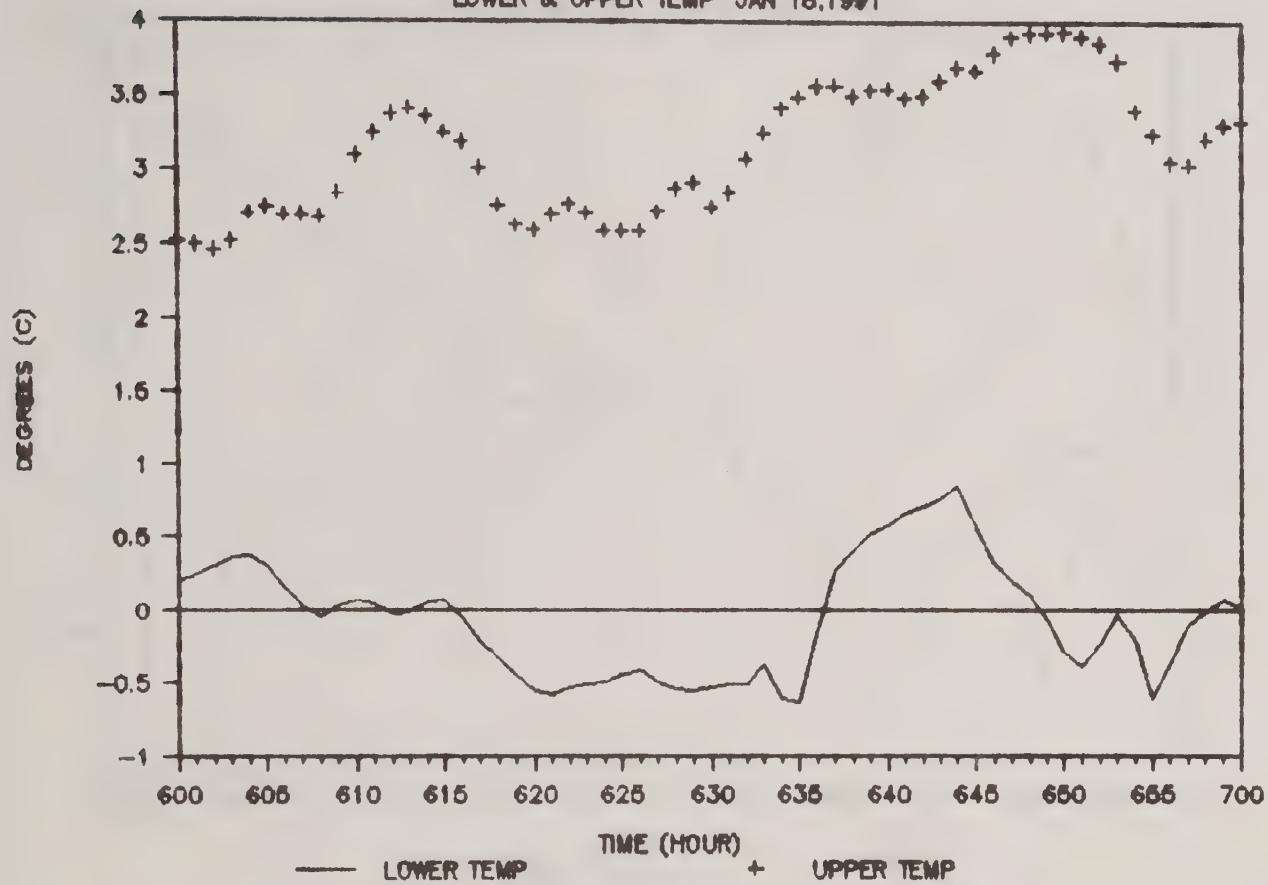
DAVIS WEATHER DATA STN #2

W-COMP/STD DEV W-COMP JAN 18, 1991



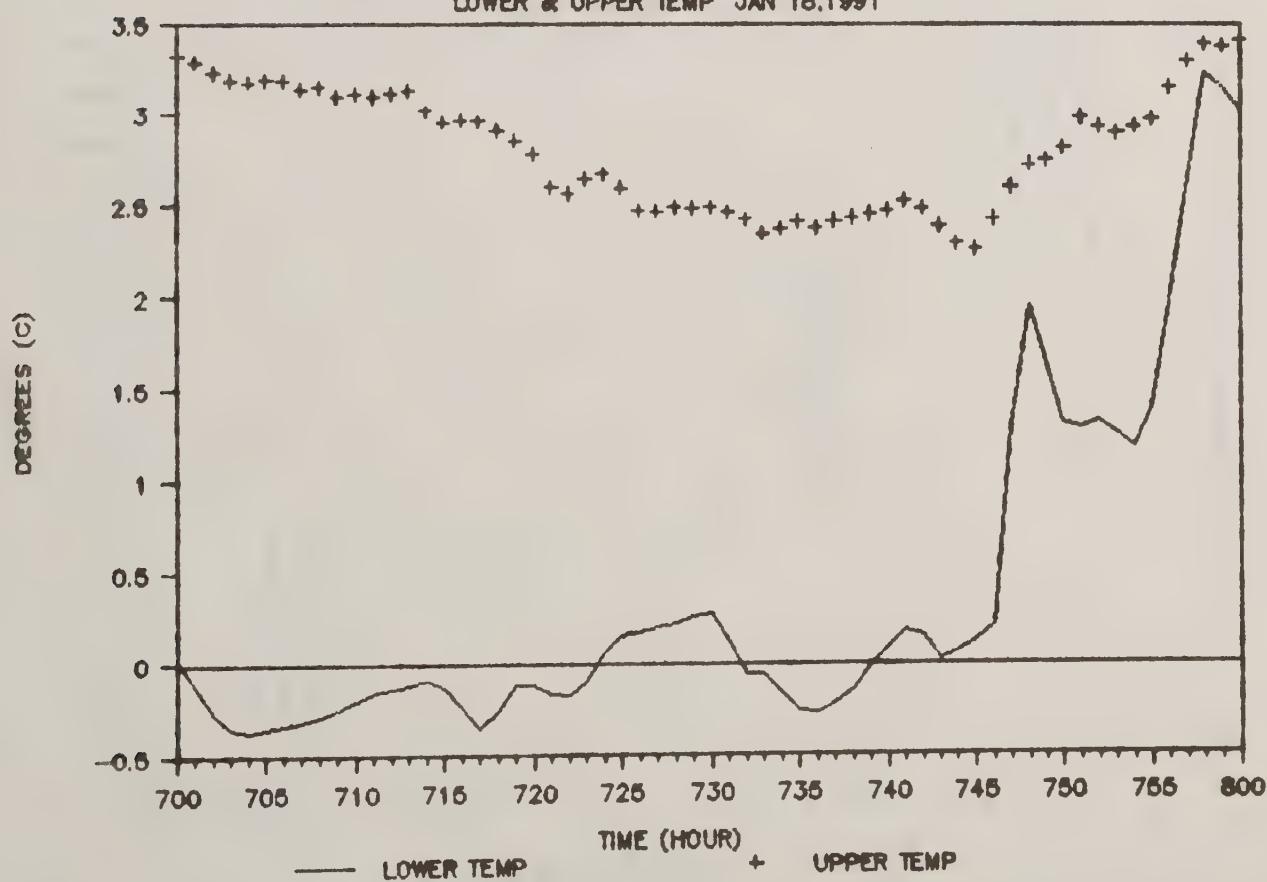
DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 18, 1991

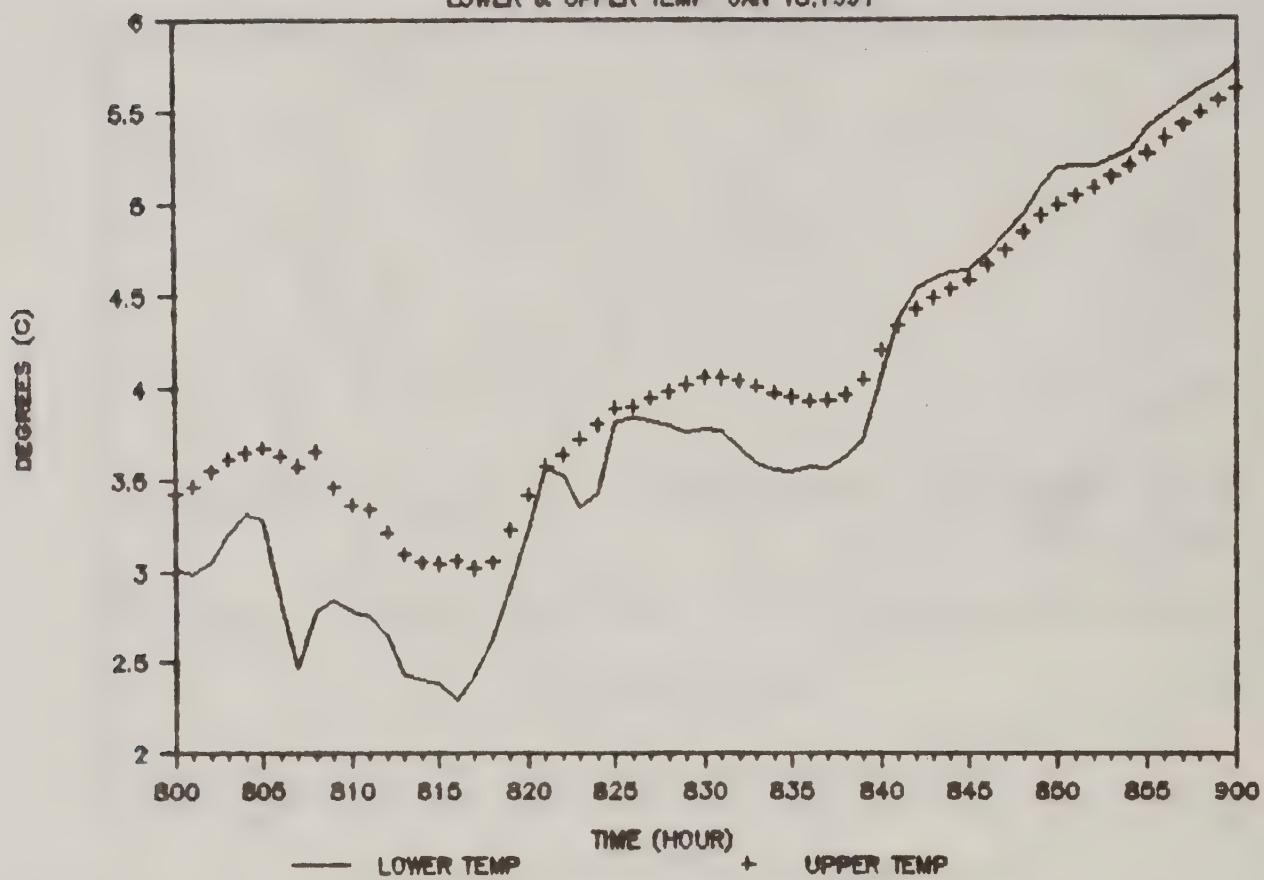


DAVIS WEATHER DATA STN #2

LOWER & UPPER TEMP JAN 18, 1991

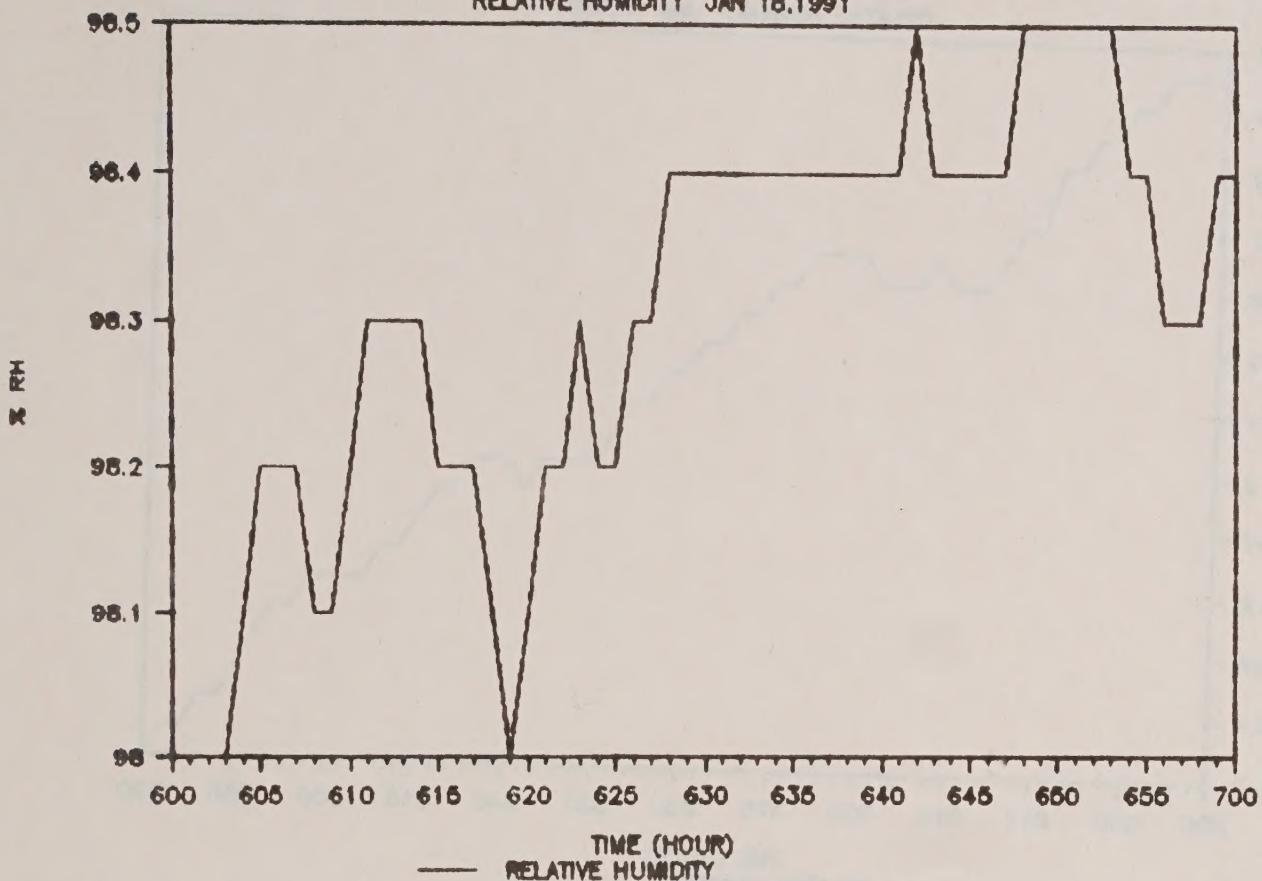


DAVIS WEATHER DATA STN #2
LOWER & UPPER TEMP JAN 18, 1991



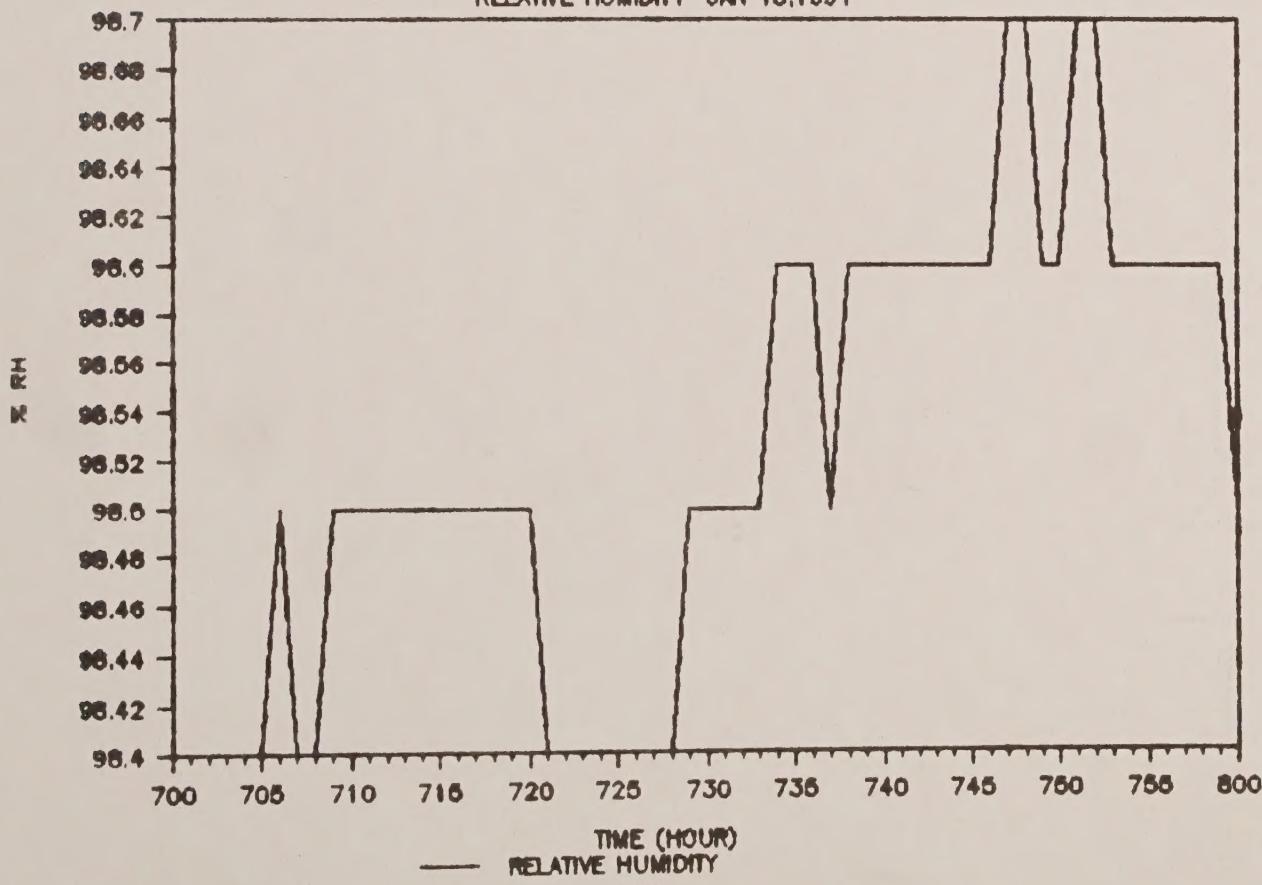
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 18, 1991



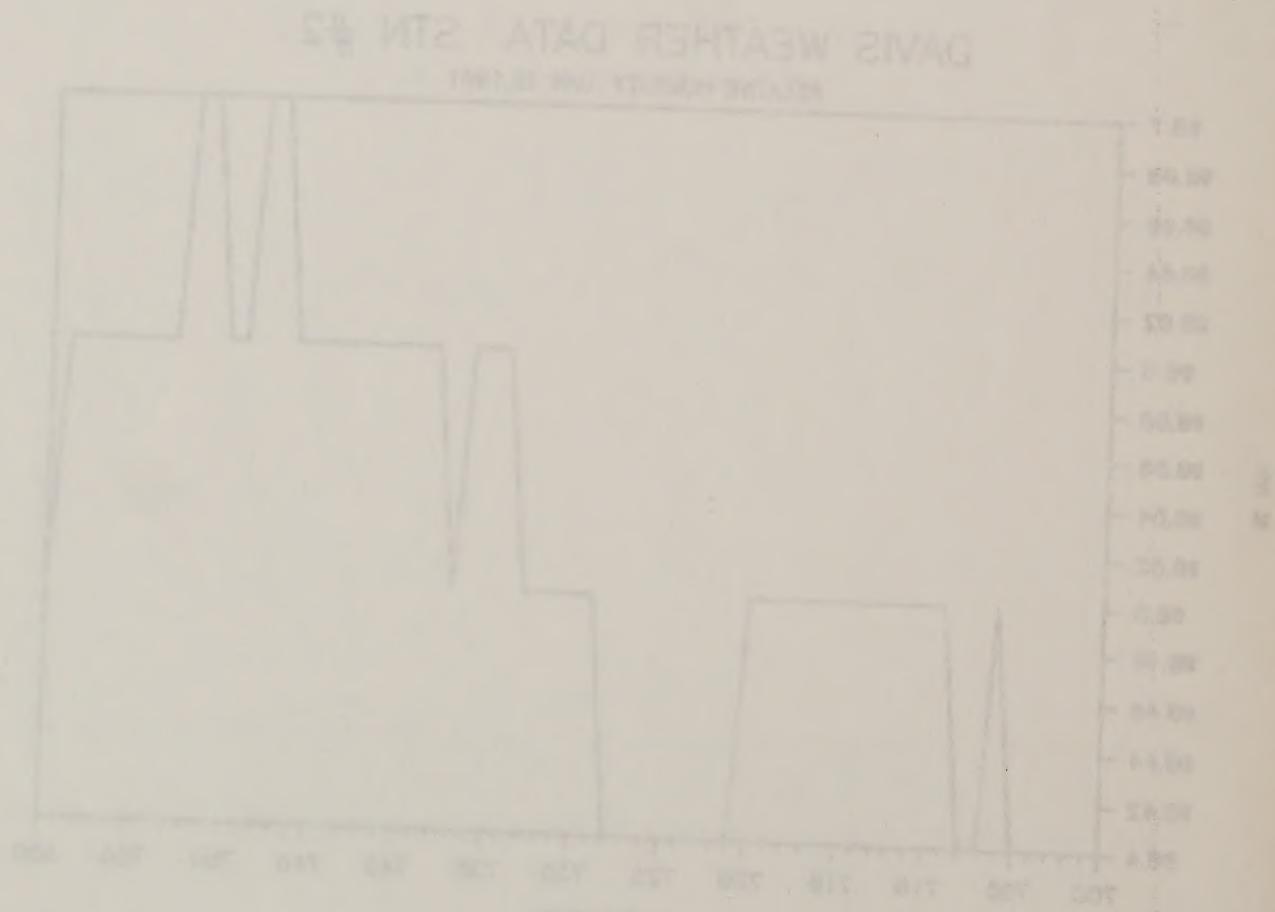
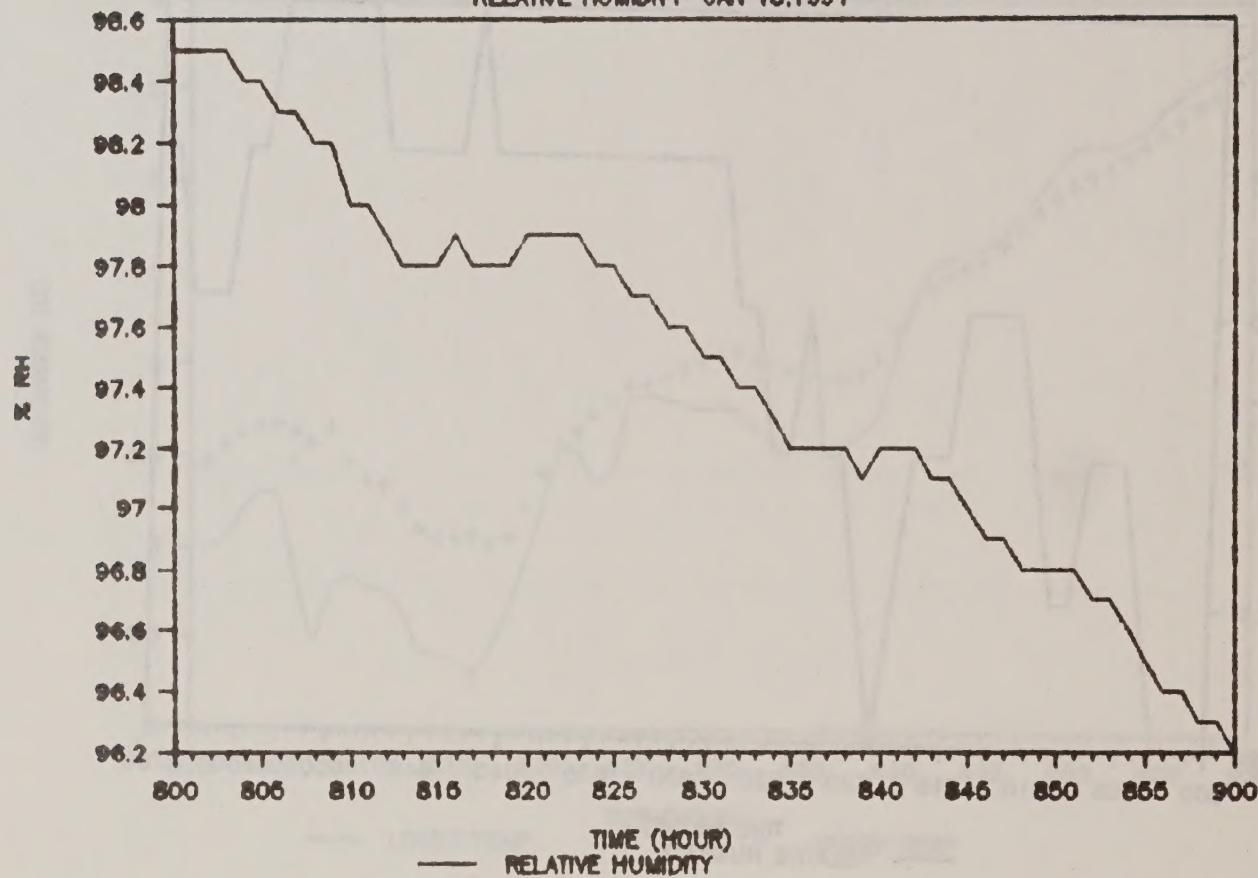
DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 18, 1991



DAVIS WEATHER DATA STN #2

RELATIVE HUMIDITY JAN 18, 1991



NATIONAL AGRICULTURAL LIBRARY



1023056653

NATIONAL AGRICULTURAL LIBRARY



1023056653